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IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 9.] September, 1939. [No. 9.

DISEASES CAUSED BY BACTERIA AND FUNGI

I. UDALL, D. H., JOHNSON, S. D., & FERGUSON, Jean. (1938). **The Control of Mastitis in New York State.**—*Vet. Rec.* **50.** 1417-1432. 1 text fig., 8 figs. on 1 plate, 3 tables.

II. HORWOOD, R. E., & BRYAN, C. S. (1938). **Mastitis Control Program Proved Successful. Program Carried on in Upper Peninsula Sub-Station Dairy Herd.**—*Quart. Bull. Mich. agric. Exp. Sta.* **21.** No. 1. 34-35.

III. KLEIN, L. A., KLECKNER, A. L., & SCHEIDY, S. F. (1938). **Comparison of the Results of Certain Milk Tests with the Condition Found on Physical Examination of the Cow.**—*Vet. Ext. Quart. Univ. Pa.* **39.** No. 72. pp. 20. 5 tables. [6 refs.]

I. In the authors' work udders are classified according to the existence of fibrosis and atrophy. Classes 1 and 2 are excellent or normal, class 3, fair, and class 4 consists of cases of chronic advanced mastitis. Subsequent laboratory examination is stated to have shown scarcely any infection in 1 and 2, a medium rate in 3, and a high rate in 4. Class 4 cows are the chief source of contagion, and their removal has a restraining effect on the spread of the disease.

While bacteriological identification of cows harbouring *S. agalactiae* is desirable in the control of mastitis the authors do not regard it as essential, and they state that a programme of complete eradication is impossible in most cases. Instead a thorough clinical examination is made, and the cows are separated into their classes. They are milked in the order :– classes 1 and 2, class 3, and finally class 4. If a cow in a clean group shows abnormality the milk is examined by the strip cup, and, if necessary, is subjected to the bromthymol blue test, the field test for chlorine or the milk incubation test, or to bacteriological investigation. Early cases detected by these means are treated by hourly milking, hot epsom salt packs, and reduction of the grain ration.

Detailed instruction on stable and milking hygiene are given to owners, with directions for washing the hands, udders, and teats with a chlorine preparation, disinfecting the stall, constructing satisfactory byres, and the purchase of additions to the herd. Remarks are made concerning special points relating to cows that are heavy producers, first-calf heifers, and freshly-introduced cows.

It is claimed that such a programme is effective in practice, and meets the needs of all concerned with the mastitis problem.

II. The elimination of mastitis by somewhat different methods to that given above is described. Chief stress was laid on the quality of the udder, and for this reason all cows were served by a bull the progeny of which had smaller and less pendulous udders than those previously found in the herd. Bacteriological examination was used to determine those cows which were affected and these were eliminated. Good husbandry and efficient sanitary arrangements prevented subsequent infection. Only two cows gave streptococci in the milk during five years, and in these the infection disappeared after subcutaneous injection of a "lacto-vaccine" consisting of 30 c.c. of infected milk with 1/3 c.c. of 1% brilliant green.

III. Examination of milk samples from two dairy fed herds was undertaken to test the reliability of certain values proposed for diagnosis of mastitis, *viz* :– leucocyte counts of one million per c.c. or over ; pH above 6·8, or chlorine content of 0·14% or over.

The cows of the two herds were subjected to a routine physical examination every month, and at the same time separate milk samples were taken from each quarter. Blood-agar plates and incubated milk samples were examined and the pH, leucocyte count, and chlorine value were determined.

In the first herd 34 cows were examined over a period of 7 months. During this period 4 cows developed mastitis. Of the 30 cows which remained free from the disease 22 had a leucocyte count of over one million per c.c., 18 a pH above 6·8, and 29 a chlorine value of over 0·14%. Four cows were in the early and six in the late stages of lactation when the high values were obtained.

In the second herd 42 cows were examined for two years ; 17 of these were affected with mastitis. Milk samples were obtained from 36 of the herd. Of these 32, 26 and 36 exceeded the stated limits for leucocytes, pH, and chlorine respectively. Positive results from the tests were obtained in some of the samples from all of the infected cows, but many were negative.

It is concluded, therefore, that leucocyte count, pH, and chlorine content cannot be used alone to detect mastitis.—D. D. Ogilvie.

Kretchmar, H. H. (1938). **The Detection of Bovine Mastitis. Results of an Examination Carried Out to Determine the Value of Certain Colour-Test Outfits.**—*J. Dep. Agric. W. Aust.* **15.** 281-284. 1 table.

Two colour-test field outfits were submitted for an opinion regarding their value in the practical detection of streptococcal mastitis : 84 tests were made with bromcresol purple and 104 with bromthymol blue, check diagnoses being made on duplicate samples by microscopic examination. The results of these tests agree with the findings of previous workers that estimates of the pH of milk using colour indicators are of limited value in the diagnosis of streptococcal mastitis.
—H. B. Carter.

Weld, Julia T. (1935). **Further Studies with Toxic Serum Extracts of Hemolytic Streptococci.**—*J. exp. Med.* **61.** 473-477. 1 table. [1 ref.]

W. has confirmed and amplified her previous findings [*V. B.* **4.** 597.] that under certain conditions serum extracts of haemolytic streptococci are haemolytic, leucocidic and toxic for mice, causing haemoglobinuria, anaemia and death. She has found that the same organisms may be extracted by this method up to six times in two days without any loss of potency of the toxin in the later extracts, providing the organisms are kept frozen solid between the extractions. The

toxins obtained in this way may be preserved without loss of toxicity for six months if they are kept frozen. Half saturation with $(NH_4)_2SO_4$ precipitates nearly all the haemotoxin in the extract.

Attempts to correlate virulence and toxin production in haemolytic streptococci using this method of extracting toxin failed. Mice inoculated with the toxin showed a marked degeneration of the tubular epithelium of the kidney.—D. L. H.

NEISSER, H. (1939). **The Serological Typing of *Streptococcus pyogenes* and Its Application to Certain Infective Conditions.**—*J. Path. Bact.* **48.** 55-66. 5 tables, 1 chart. [Numerous refs.]

The method of GRIFFITH [*V. B.* **5.** 399.] was used in typing 1,211 strains of *Str. pyogenes* isolated from clinical infections in man. Of this number, 70 % were identified as belonging to one or other of Griffith's Types.

It was shown that Types 1, 2, 3, and 4 predominate in scarlet fever, Types 1 and 2 producing more severe infections than 3 and 4. In open wards a change of type often occurs due to cross-infection. There is much discussion concerning the types of streptococci in certain human conditions.—JOHN FRANCIS.

I. IVÁNOVICS, G., & BRUCKNER, V. (1938). Chemische und immunologische Studien über den Mechanismus der Milzbrandinfektion und -Immunität. II. Mitteilung. Untersuchung der Spezifizität der Milzbrandimmunsera mit verkuppelten Azoproteinen. **[The Mechanism of the Infection with, and Immunity to, Anthrax. II. The Specificity of Anthrax Antisera with Coupled Azoproteins]**.—*Z. ImmunForsch.* **93.** 119-136. 5 tables. [13 refs.]

II. TOMCSIK, J., & IVÁNOVICS, G. (1938). Ueber die Herstellung des Antikapsel-Immunkörpers des Milzbrandbazillus. **[The Preparation of Anticapsular Immune Body of *B. anthracis*]**.—*Ibid.* 196-208. 4 tables. [12 refs.]

III. TOMCSIK, J., & IVÁNOVICS, G. (1938). Die Schutzwirkung des Milzbrand-Antikapsel-Immunkörpers gegenüber der Milzbrandinfektion. **[Immunizing Action of the Anthrax Anticapsular Immune Body Against Anthrax]**. —*Ibid.* **94.** 28-44. 7 tables. [10 refs.]

IV. IVÁNOVICS, G. (1938). Ueber die Milzbrandimmunität. **[Immunity to Anthrax]**.—*Ibid.* 436-458. 8 tables. [Numerous refs.]

I. As confirmatory support to their contention that the anthrax capsule haptene is a polypeptide compound of d (—) - glutamic acid [see *V. B.* **8.** 746.], the authors have shown that anthrax antiserum (containing capsule antibody) gives a specific serological reaction with synthetic glutamic acid-azoprotein antigen. Furthermore this reaction is even more specific than that occurring between the synthetic glutamic acid-azoprotein antigen and its homologous serum. On the other hand, no serological reaction was found to occur between either anthrax somatic antigen or capsular antigen and antibody prepared against the synthetic glutamic acid-azoprotein antigen.

II. Anti-anthrax immune serum was prepared by injecting rabbits intravenously with heat-killed anthrax bacilli. This method resulted in a 25 % mortality during the course of immunization. In about 60 % of the surviving rabbits antibodies were formed against both the capsular antigen (P-substance) and against the non-specific somatic polysaccharide (C-substance). The amount of antibody generally formed against capsular antigen was not high, precipitation generally only occurring with antigen dilutions of 1:500,000 to 1:1,000,000. In the course of hyperimmunization C antibody tended to disappear. P-substance was only antigenic when associated with the bacteria. This indicates that the purified P-substance is a true haptene.

III. When ascertaining the protective value of capsular antibody the authors encountered a surprising difference between the effect of such antibody upon rabbits and g. pigs on the one hand and upon mice on the other. Neither rabbits nor g. pigs could be immunized passively with reasonable doses of capsular antibody, whereas these animals, when immunized with killed capsulated anthrax vaccine, showed a strong immunity. [This indicates that in these animals capsular antigen has no essential immunizing effect and that immunization is only produced by some somatic antigen apparently unrelated to the C-substance]. In the case of mice however, it was possible to protect passively against 10-100 M.L.D. of virulent anthrax with reasonable doses of anticapsular antibody, whereas antiserum containing no capsular antibody failed to protect. [So far as can be judged, mice are unique in the nature of their susceptibility and resistance to anthrax. The larger domestic animals are similar to rabbits and g. pigs in this respect, for they can be immunized with vaccine made from avirulent, non-capsulated R-variants such as are used by STERNE [*V. B.* **8.** 746]. An incidental but noteworthy point in connection with mice is that this work explains their unsuitability for use in the standardization of commercial anthrax antiserum, since they are sensitive only to the capsule antigen and antibody which is apparently of no consequence in other animals].

IV. BAIL showed that it is possible to immunize animals against anthrax with fluid taken from anthrax oedema fluid even after any organisms which happen to be present have been killed, and this is the only known way in which either killed anthrax bacilli or extracts thereof can be used successfully for immunization. The author has confirmed Bail's findings in all respects but he has furthermore shown that such oedema fluid is immunogenic even though it contains no capsular antigen (P-substance). This was done by using STAMATIN'S [*V. B.* **7.** 154.] and STERNE'S [*V. B.* **8.** 746.] uncapsulated R-variants for producing oedema fluid, and incidentally testing the resulting fluids by serological means for the presence of capsular antigen. These findings lend further support to his contention that, with the exception of the action on mice, the capsular antigen has no immunogenic significance.—E. J. PULLINGER.

STAMATIN, N. (1938). Immunisation des animaux de laboratoire et du mouton contre le charbon au moyen de souches non capsulogènes mais oedématogènes de *Bacillus anthracis*. [**Immunization of Laboratory Animals and Sheep against Anthrax with Non-Capsular but Oedematogenic Strains of** *B. anthracis*].—*Ann. Inst. Pasteur.* **61.** 394-414. 4 figs., 3 tables. [17 refs.]

Although the present tendency is to use less virulent strains of anthrax for the production of vaccines, accidental deaths are still likely to occur, especially in sheep. In culturing virulent anthrax bacilli in horse blood, a mucoid variant appears which on sub-culture produces mucoid and rough colonies. The rough colonies are non-capsulated and some of these colonies are found to produce oedema when inoculated into mice or g. pigs. Once isolated these properties are retained through repeated sub-cultures and are also unchanged by passage in mice. This strain may kill mice in the usual doses, but not g. pigs or rabbits. Experiments were performed on mice, g. pigs, and rabbits, and showed that protection was afforded by inoculation with the oedema-producing non-capsulated strain. The oedematous fluid taken from mice and formolized and inoculated into rabbits also showed considerable powers of protection. Sheep inoculated with the variant strain in doses of 1-5 c.c. of 24-hour broth culture were protected against subsequent inoculation with broth culture of virulent anthrax and in further experiments favourable comparisons are afforded with other types of vaccine strains.—S. J. G.

MINETT, F. C. (1938). **The Royal Sanitary Institute, Health Congress at Portsmouth. Section D.—Veterinary Hygiene. Presidential Address [Control of Bovine Tuberculosis].**—*J. R. sanit. Inst.* **59.** 427-435. [18 refs.]

The subject is dealt with from the point of view of the research worker under three headings :–

(1). Among the questions considered regarding tuberculin and its uses were the manufacture of tuberculin, methods of testing, standardization, specificity, and the frequency with which the tuberculin test should be applied in herds from which TB. is to be eradicated.

(2). In the review of experiments on eradication and the incidence of TB. in Great Britain, brief reference is made to the work of JORDAN and of EDWARDS at the Hannah Dairy Research Institute, and to the results of the survey tests by MONTGOMERIE and of ROWLANDS in Wales, by RABAGLIATI in Yorkshire and by WILSDON in Herefordshire. The incidence of TB. in herds and in the areas as a whole is discussed.

(3). The resistance of the tubercle bacillus in the outer world and the routes by which it may invade the body are considered. The work at the National Institute for Research in Dairying at Reading on the survival of the tubercle bacillus on pasture is referred to.—J. C. WALLACE.

CAMERON, A. E. (1938). **Bovine Tuberculosis in Canada.**—*Canad. publ. Hlth J.* **29.** 262-265.

C. points out that the work conducted by the Health of Animals Division of the Dominion Department of Agriculture benefits not only the live stock industry but also public health. Approximately one third of the cattle in Canada is under supervision for the control of TB. At present the extent of bovine TB. in Canada does not exceed 3%. C. explains the three different plans available for TB. control and the means of carrying them out. Data on the accredited herds etc. in the various provinces and counties is also given.—J. L. BYRNE.

I. RAUTMANN, H. (1937). Erfahrungen mit dem Tuberkulosetilgungsverfahren unter besonderer Berücksichtigung der intrakutanen Tuberkulin-Reaktion. **[The Intradermal Tuberculin Test in TB. Eradication].**—*Dtsch. tierärztl. Wschr.* **45.** 81-86. 1 table.

II. FRITZSCHE. (1938). Rückblick und Ausblick auf die Tuberkulosebekämpfung der Rinder. **[The Control of Bovine TB.]**—*Ibid.* **46.** 90-91.

I. Opinion in Germany has in the past few years come to the view that even the somewhat elaborate methods used there to detect open cases of TB in the Ostertag scheme have done little to reduce the disease. Workers in various provinces, therefore, have recently been collecting data regarding the percentage of cattle affected with TB. as determined by the tuberculin test. R. reports observations made on 3,551 cattle belonging to 259 herds in Saxony and regarded as representative of all types of herds. A single intradermal test was used, carried out behind the shoulder, and R. describes a simple form of crush used to restrain the animals conveniently.

Positive reactions were found in 49·1% of the 3,551 animals, *viz*, 64·8% of bulls, 86·2% of oxen, 65·9% of cows, 44·5% of young stock over one year, and 19·5% of young stock under one year. Distribution according to size of herds was as follows :– 1-5 animals, 29% positives ; 6-20 animals, 37%, 21-50 animals, 60·5%, and 51 or more animals, 59·1%. The incidence of reactions in the various age groups was similar in herds of all sizes, except that in the larger herds the incidence of infection in young animals was lower (relative to the infection in

adult stock) than in the smaller herds, a finding ascribed to the fact that in the larger herds the young cattle are usually reared apart from the adult cattle and thus protected from the common respiratory route of infection.

Of the 259 herds, 70 (26·6%), all with less than 21 cattle, were free from reactors. A further 90 herds (35·1%) had no reactors amongst the young stock, most of these being herds with 6-50 cattle. R. notes that the total number of young stock in these 160 herds would have only been sufficient to supply about one half of the young stock required for replenishment of the total 259 herds dealt with.

The incidence of positives was similar in breeding and in dairy herds, but was lower in all age categories amongst the Harz cows, a circumstance believed to be due to the fact that they are largely kept out of doors. The effect of nutrition and general hygiene is discussed, and R. supports definitely the view that education of the farm workers is of primary importance and must be done by personal contacts. Separate houses for calves, young stock, and adult stock are regarded as essential. Practical difficulties appear to be considerable, however, because only a small percentage of farmers have so far joined the eradication scheme based on tuberculin testing.

II. F. supports strongly the view that clinical examination, even including examination of tracheal mucus, etc., does little towards the control of bovine TB., and that the rearing of a new herd from young stock which are negative to tuberculin and complement-fixation tests, is the only useful method. Such new herds should be tuberculin-tested at six-monthly intervals until no reactors appear, and then at longer intervals. Any open cases among the remaining animals should be disposed of as soon as possible.—A. W. STABLEFORTH.

ROSSI, P. (1937). Observation sur la diffusion de la tuberculose dans la commune de Castiglion d'Orcia (Sienne). **[Bovine Tuberculosis in Siena, Italy]**.—*Boll. Sez. ital. Soc. int. Microbiol.* **9.** 85-88. [In French].

A brief account of the results of the ophthalmic test on 28 animals.

PRICE, R. M. (1938). **Bovine Tuberculosis in Children.**—*Canad. publ. Hlth J.* **29.** 251-254.

The present investigation in Toronto was begun in 1926 under the National Research Council, to determine the incidence, the role of milk in transmission, and the effect of eradication of tuberculosis in cattle and of more widespread pasteurization.

The results indicate :– (1) that 9·6% of extrapulmonary tuberculosis under 14 years is caused by the bovine type ; (2) that this is an ingestion infection, raw milk being the vehicle, and (3) that this infection can be controlled by pasteurization, and its decrease is due to elimination of the disease in cattle, and more important still, to pasteurization throughout Ontario. P. believes universal pasteurization would eliminate this type of infection in Ontario in five years.—C. MACKIE.

PALLASKE, G. (1939). Untersuchungen zur Frage der Diagnostik, des Wesens und der Bedeutung der Eutertuberkulose des Rindes. **[Nature and Diagnosis of Udder Tuberculosis in Cattle]**.—*Arch. wiss. prakt. Tierheilk.* **74.** 99-116. 8 figs. [3 refs.]

P. describes the histological changes which he found in 109 tuberculous udders examined. Some of these were udders actually excreting tubercle bacilli in the milk, whilst others were only identified as tuberculous after P.M. examination. The pathology of open and closed udder tuberculosis is compared and a discussion of the pathogenesis is also included, the author showing a preference

for the theory which postulates a haematogenous route of infection. The hygienic aspects of udder tuberculosis are also considered.—E. J. PULLINGER.

TIMONEY, J. F. (1939). **Avian Tuberculosis in the Cow.**—*Vet. Rec.* **51.** 191-198 and 239-243. [Numerous refs.]

T. describes a case of tuberculous mastitis in a cow, from which avian tubercle bacilli were isolated. The cow came from a small holding on which there was a flock of fowls. Members of the flock had occasionally died from a wasting disease, but the cause of death was not investigated. Acid-fast organisms were demonstrated in the milk, but on inoculation into a g. pig they only gave rise to localized retrogressive lesions of the local lymph nodes. These g. pig. lesions yielded a pure culture of organisms which were shown to be avian tubercle bacilli on cultural and pathogenicity tests.

At the P.M. examination of the cow, the udder was found to be extensively affected with tuberculosis ; lesions were also present in the thoracic and abdominal cavities. These lesions were not examined bacteriologically.

In the second part of his article T. describes attempts to reproduce tuberculous mastitis in a lactating and a non-lactating cow with avian tubercle bacilli from the above case.

The lactating cow ceased to react to avian tuberculin 107 days after inoculation, but the non-lactating cow continued to react for 314 days after artificial infection.

The bacilli could be recovered only from the infected quarter. No macroscopic lesions of tuberculosis could be found P.M. 440 days after inoculation. The inoculated organisms remained unaltered in virulence for the fowl.—D. L. H.

HEPDING, L. (1938). " Ballenabszess des Huhnes " und Tuberkulose. [**Bumblefoot and TB. in Fowls**].—*Dtsch. tierärztl. Wschr.* **46.** 596-598. 2 figs. [8 refs.]

A clinical and histological description of " bumblefoot " is given. The cause has been shown to be the avian tubercle bacillus, but the strains which produce such lesions are not entirely typical, as they have a relatively high pathogenicity for g. pigs. A condition simulating naturally acquired bumblefoot has been reproduced by the injection of such strains of tubercle bacilli.—E. J. PULLINGER.

FREUND, J., & ANGERINE, D. M. (1938). **The Spread of Tubercle Bacilli in the Bodies of Sensitized and Immunized Animals.**—*J. Immunol.* **35.** 271-288. 1 fig., 3 tables. [15 refs.]

The authors have compared the spread of tubercle bacilli in normal and immunized rabbits after inoculation of the living organisms into the skin. Tubercle bacilli multiply in the skin of rabbits immunized with heat-killed tubercle bacilli in the first few days after inoculation. This multiplication is more abundant than in rabbits which are infected. There is however a difficulty in assessing the number of bacilli at the site of inoculation when the lesion is advanced enough to slough, as bacilli are discharged with the slough.

Tubercle bacilli introduced into the skin of hypersensitive rabbits with demonstrable antibodies reach the local lymph node 2-14 days later than they do in normal rabbits.

It was found that tubercle bacilli multiplied at the site of inoculation, although they did not spread to the lymphatic system ; thus retardation of spread is not due to destruction of the bacilli but to some form of local fixation.—D. L. HUGHES.

VALLE, A. L. (1937). A tuberculose bovina contagia o homem ? [**Bovine Type Tuberculosis in Man**].—*Bol. vet., Brasil.* **1.** 68-71. 3 tables.

V. refers to a number of cases of human tuberculosis, particularly in children, caused by the bovine bacillus.

TROSSARELLI, L., & CELORIA, Maria L. (1938). Ricerche comparative sui terrien di isolamento e coltivazione del Mycobacterium tuberculosis bovis. [**Comparison of Culture Media for** *Mycobact. tuberculosis* (**Bovine Type**)].—*G. Batt. Immun.* **20.** 672-680. 1 table. [9 refs.] [English, French and German summaries].

After dealing briefly with the various media claimed to be selective for the isolation and cultivation of bovine tubercle bacilli, the authors give the results of their own experiments, and conclude that the best media are Petragnani's with pure beeswax, and Frimodt-Möller's, a modification of Löwenstein's medium in which the glycerin is replaced by 4% galactose and 0·15% alanin. They obtained growth in only 12·3% of cases on Petragnani's medium, in 29% on Löwenstein's, in 40·9% on Frimodt-Möller's, and in 55·5% on Petragnani's with pure beeswax ; the most luxuriant growth was obtained on Frimodt-Möller's medium.—A. J. C.

BOQUET, A. (1939). Sur la culture de bacille de l'entérite paratuberculeuse hypertrophiante des bovidés. (Bacille de Johne). [**Culture of** *Mycobacterium johnei*].—*C. R. Soc. Biol. Paris.* **130.** 200-202. [7 refs.]

Cultures were isolated from the intestine and lymph nodes by treating the ground-up tissue with 10% sulphuric acid or 4% NaOH for 10-15 minutes, neutralizing and sowing on to Löwenstein's medium enriched with *Mycobact. phlei* extract. Subcultures were made on to potato enriched with Sauton's fluid plus a 10% glycerin extract of *M. phlei.* After a year, numbers of cultures which had been subcultivated every month grew well on potato enriched with Sauton's fluid without the bacterial extract, and still later they grew on potato with the addition of 5% glycerin alone. The adaptation, however, was not complete as they did not grow in pure Sauton's fluid unless a 10% extract of *M. phlei* was added. The addition of aqueous extracts of potato produced a slight growth. In some cases, when *M. phlei* was inoculated on unenriched Löwenstein's medium, a few colonies developed after a considerable period.—JOHN FRANCIS.

I. PATERSON, J. S. (1939). **Flagellar Antigens of Organisms of the Genus** *Listerella.*—*J. Path. Bact.* **48.** 25-32. 1 fig. on 1 plate, 5 tables. [17 refs.]

II. BARBER, Mary. (1939). **A Comparative Study of** *Listerella* **and** *Erysipelothrix.* —*J. Path. Bact.* **48.** 11-23. 21 figs. on 3 plates, 5 tables. [12 refs.]

I. In this investigation 27 strains of *Listerella* isolated in various parts of the world from a variety of hosts—animal, human, and avian—were studied. Maximum motility was reached after 5-7 hours growth in dextrose broth at 25°C. The method of staining to demonstrate the peritrichous flagella is described. The organisms appeared to possess a well-defined capsule, but further work on this point is in progress.

Agglutination and agglutinin-absorption tests were performed. The method of preparing the antigens and antisera and the technique of the tests are described. The results of these tests indicated that all the strains had a common antigen, but that one or more other antigens existed which permitted their division into three main groups. A preliminary examination of a strain of *Listerella* from a case of meningitis in a child indicated that it was antigenically distinct from the other strains of *Listerella* examined.

II. Five strains of *Listerella* and six of *Erysipelothrix* from various sources were compared. Neither possessed capsules or formed spores, both showed a striking difference in morphology and colony growth between smooth and rough forms, and both rough forms produced enormous filaments when grown at room temperature. *Erysipelothrix* was a much more slender organism than *Listerella*. Smooth strains of *Listerella* were smaller in old cultures than in young, but the reverse was true of smooth strains of *Erysipelothrix*. Cultural characteristics were found to be similar, but *Listerella* grew much more profusely and showed more biochemical activity than did *Erysipelothrix*. The former was motile, the latter non-motile.

There was no antigenic relationship between the two organisms. They were both pathogenic to rabbits and mice although there were considerable differences in the diseases produced. Both produced areas of focal necrosis in the liver of mice and a circulating monocytosis in rabbits. *Listerella* was pathogenic to g. pigs, but *Erysipelothrix* was not. The pathogenicity for pigeons was not fully investigated, but the strains of *Listerella* tested were non-pathogenic.

B. concludes that until further work is done the names *Listerella* and *Erysipelothrix* should be retained.—JOHN FRANCIS.

I. SHIRLAW, J. F. (1938). **On the Existence of Haemorrhagic Septicaemia in the British Isles.**—*Vet. Rec.* **50.** 1005-1009. [8 refs.]

II. TURNER, P. R., & HOLMES, C. R. (1938). **Epizootic Bovine Pasteurellosis in Great Britain.**—*Ibid.* 1010-1011.

III. ANON. (1938). **Does Bovine Haemorrhagic Septicaemia Occur in Great Britain?**—*Ibid.* 1017-1018. [2 refs.]

I. A summary is given of the arguments for and against the existence of this disease in cattle in the British Isles. S., who has had considerable experience of the disease in India, recalls cases in cattle which he met in an outbreak in Northumberland in 1926. The symptoms were chiefly those of sudden and acute pneumonia, with temperatures of 105°-108°F., dyspnoea, and swelling of the throat. Early death was usual, although occasionally a more chronic type occurred. Autopsy revealed lesions of H.S., and in acute cases the gastro-intestinal tract was always involved. Complete bacteriological examination of a yearling destroyed in the acute phase of the disease showed typical bipolar organisms in blood films, lungs, lymph nodes, spleen, and liver. The organism was identified as a pasteurella of group I (Jones). The work of TWEED and EDINGTON [(1930). *J. comp. Path.* **43.** 234.] has substantiated these observations, and it is concluded that the disease in question exists in both the septicaemic and the pneumonic forms in Northumberland.

II. An outbreak of H.S. in a mixed herd of 212 cattle is described. The total number of deaths was ten heifers and ten calves 12 weeks old. The symptoms included coughing, quick, short, painful respiration, dejection, and painful stiffness. Early diarrhoea was usual, followed by constipation. P.M. examination showed that significant lesions were confined to the lungs, which had a marbled appearance suggestive of contagious bovine pleuro-pneumonia. Smears from the lungs, spleen, liver, and small intestine, however, revealed large numbers of pasteurella. H.S. bacterin was effective in controlling the outbreak. The average course of the disease appeared to be about three weeks.

Details are given of three further outbreaks involving 57, 9, and 7 cattle respectively. Each animal received 5 c.c. of bacterin, and recovered.

III. A summary of the position in the light of these reports leads to the conclusion that in all probability H.S. does exist in Great Britain, where it tends to assume a subacute form.

The criteria necessary for accepting the more chronic forms of disease, in which pastuerella organisms are demonstrated on autopsy, as primary pasteurelloses, are as yet undefined. In this respect it is emphasized that the disease in question can be revealed by changes other than haemorrhagic septicaemia, and that its lesions frequently resemble those of contagious bovine pleuro-pneumonia. The causative organisms are known to change readily in virulence and thus further complicate diagnosis. As a group, however, their response to serum and vaccine therapy is very striking and such a response is indicative and may even be diagnostic in susceptible animals.

A number of points remain obscure not only with regard to the forms of the disease, but also with regard to the mechanism of natural transmission.—D. D. O.

LESBOUYRIES, BERTHELON, & BRAZIER. (1938). Mammite pasteurellique de la vache. [**Bovine Mastitis Caused by Pasteurella**].—*Rec. Méd. vét.* **114.** 710-713. [3 refs.]

The authors describe an outbreak of mastitis in a herd of twelve cows. Nine of the animals were affected, and the attacks varied in severity; in some cows there were constitutional symptoms, and pain and swelling of the udder, and in others a chronic swelling and induration of the udder, and alteration in the quality and quantity of the milk secreted. Treatment of the affected quarters by frequent milking and the use of a sulphonamide derivative did not reduce the induration. The disease was shown bacteriologically to be due to pasteurella organisms. These animals had all suffered from foot and mouth disease in a mild form, and without mammary lesions, and it was about a fortnight to three weeks after the outbreak of this disease that the cases of mastitis began to appear. It is suggested that owing to the continued decubitus of the animals, and because tissue resistance was reduced by F. & M. disease, the pasteurella organisms, normally saprophytic, were able to establish themselves within the mammary gland.—R. ISHERWOOD.

VITTOZ, R. (1938). Pasteurellose porcine en Cochinchine. [**Haemorrhagic Septicaemia in Swine in Cochinchina**].—*Rec. Méd. vét. exot.* **11.** 167-177. [17 refs.]

The pig population of Cochinchina is 700,000, and pasteurellosis is a serious disease. Virulent pasteurella were isolated from 65 out of 125 nasal pus specimens from pigs with pneumonia. A brief description is given of several outbreaks due to pasteurella. The association of the disease with low-lying land is discussed. Outbreaks occur in the rainy season; they are also coincident with the occurrence of pasteurellosis in buffaloes and fowls.

Of twelve outbreaks of swine disease studied by the authors since 1935, five were due to pasteurella, four to the swine fever virus associated with pasteurella, two to the swine fever virus associated with salmonella, and one to swine fever virus alone.—F. H. MANLEY.

HILBERT, K. F., & TAX, H. (1938). **The Value of Chemically-Killed Cultures for the Control of Cholera in Ducks.**—*Cornell Vet.* **28.** 275-280. 4 tables.

The authors have drawn attention to the difficulties of combating infectious diseases encountered in the duck-raising establishments of Long Island, these difficulties being chiefly due to overstocking. The losses are for the most part in ducklings, but breeding flocks are not exempt. Losses are expected by the owners of birds, and the economics of the industry have been adjusted accordingly. The most common disease is *Pasteurella aviseptica* infection. The authors used a phenol-killed bacterin of this organism, originating in the flock on which it is to be used. The ages of ducklings at inoculation varied from 29 to 65 days.

On four ranches 45,411 ducks and ducklings were vaccinated, and 5,761 birds, raised and fed with the others, were kept as controls. Mortality from duck cholera averaged 4·1% in vaccinated birds, and 29·4% in controls.—R. ISHERWOOD.

HUMPHREYS, F. A., & MOORE, T. (1938). **Haemorrhagic Septicaemia Bacterins and Their Relation to Serological Reactions.**—*Canad. J. comp. Med.* **2.** 282-284. [6 refs.]

Serological work on rabbits, g. pigs and cattle indicated that it is highly improbable that the injection of H.S. bacterins stimulates the formation of antibodies in the serum which combine with *Brucella abortus* antigen to bring about a positive reaction in serological tests for brucella infection. If such reactions occur the evidence would suggest that the injected bacterin also contained *Br. abortus.* The complement-fixation test has been found more reliable than the agglutination test for the detection of pasteurella antibodies.—D. G. MCKERCHER.

LAURITA, R. (1937). Il B. bubalisepticus nel midollo osseo. Ricerche sperimentali. [*Pasteurella bubaliseptica* **in the Bone-Marrow**].—*Profilassi.* **10.** 14-16. [16 refs.]

In view of the difficulty in diagnosing pasteurellosis unless fresh material is available, L. advocates packing bone-marrow in charcoal when it is necessary to preserve material for examination. He states that in material so treated the organisms would be demonstrable for 59 days; the organisms would lose their virulence, however, after six days.—HANS GRAF (ZÜRICH).

NELSON, J. B. (1939). **Growth of the Fowl Coryza Bodies in Tissue Culture and in Blood Agar.**—*J. exp. Med.* **69.** 199-209. 3 tables. [7 refs.]

N. describes the nature and growth requirements of small coccobacilliform bodies in nasal exudate resulting from fowl coryza, and prefers to use this descriptive term rather than to designate a new bacterial genus at present. The culture medium generally used was that previously described [*V. B.* **7.** 519.], in which a faint turbidity, unreliable as evidence of growth, was sometimes noted at 24 hours. Living tissue cells were not essential for growth, but better results were obtained with them. Experiments showed that factors of a diffusible nature, and derived from tissue cells, allowed growth, and that tissue cells gradually lost this factor after storage at 10°C. Increase of this growth factor in the supernatant of culture media was proportionate to the length of storage up to five days. The growth factor was inactivated at pH 6·0, but withstood a temperature of 100°C. for one hour.

The results of culture in post embryonic tissue (liver, spleen and blood) media are detailed. After artificial tissue culture for 80 generations the organisms survived on blood agar slopes and multiplied slightly after the 120th generation, but the virulence of one strain was lost on blood agar at the 83rd subculture. Tissue cultures survived storage at 10°C. for two weeks and, after desiccation, the period of survival appeared to be connected with the amount of sub-culture previous to desiccation.—C. V. WATKINS.

SANTAGOSTINO, C. (1938). La mastite acuta parenchimatosa delle bovine da germi Coli-aerogenes. [**Acute Bovine Parenchymatous Mastitis Caused by the** *coli-aerogenes* **Group**].—*Clin. vet., Milano.* **61.** 523-532. [Num. refs.]

S. notes that this form of the disease always commences with high fever and almost entire cessation of milk secretion; the affected udder contains a yellowish alkaline liquid, full of leucocytes, and oedema and haemorrhagic foci are present.

a review is given of previous work on mastitis, from 1876 onwards in which various bacilli have been isolated as causes of the disease. S. emphasizes that, although the disease is an infectious one often transmitted by milkers, there may be predisposing causes, *e.g.* digestive disturbances, frequently revealed by diarrhoea. The incubation period is very brief, a cow often lactating normally up to within 10-12 hours of developing all the symptoms of an attack.

The initial symptoms are unmistakeable where organisms of the *coli-aerogenes* group are concerned ; the temperature rises rapidly and rumination stops simultaneously with the cessation of milk secretion. The secretion drawn from the affected udder is a pale yellow, and sometimes contains red clumps : if churned for butter it leaves a liquid resembling blood serum, with a yellowish or reddish sediment. S. reports his own experiments and describes the action of the *coli-aerogenes* group. Death may result on the second or third day, and an account is given of P.M. appearances. He found inoculation with anti-*coli* serum effective, but only if administered promptly.—S. F. J. HODGMAN.

GWATKIN, R., LE GARD, H. M., & HADWEN, S. (1938). **Bovine Mastitis : Infection Due to Organisms of the Coli-Aerogenes Group.**—*Canad. J. comp. Med.* **2.** 155-162. [9 refs.]

This paper is composed of the histories and bacteriological findings of ten cases, among 286 cases of mastitis examined, in which organisms of the *coli-aerogenes* group were apparently incriminated. Six of the ten cases died, and four of them recovered. The suggestion that the organisms in question were not casual contaminations is supported by the fact that cultural tests indicate the presence of members of the group to be comparatively rare in either milk or colostrum from animals without mastitis. It is suggested that symptoms produced by this type of infection in recently freshened cows may be mistaken for milk fever.—L. M. HEATH.

OGUNI, H., & KAIHOTSU, M. (1938). **Suppurative Periostitis of Horses Caused by** *Salmonella abortus-equi*.—*J. Jap. Soc. vet. Sci.* **17.** 228-240 of pt. 1. 2 figs. on 2 plates. [In Japanese : abst. from English summary pp. 110-111 of pt. 2].

The authors describe suppurative lesions in horses caused by *S. abortus-equi*. Abscesses occur in the limb joints, lymph nodes, thoracic walls, withers, and scrotum.

The lesions tend to indurate and they may discharge a foul smelling creamy pus ; the suppurative process in the limb lesions may extend into the deeper muscular tissue and reach the bone. The bone at first is covered by thick fibrous connective tissue, which is later changed as an ossifying periostitis develops.

—D. L. HUGHES.

I. DEDIÉ, K. (1937). Gibt es Enteritis (Gärtner) -Dauerausscheider unter Füchsen ? [**Foxes as Continuous Excretors of** *Salmonella enteritidis*].—*Dtsch. tierärztl. Wschr.* **45.** 453-454. [6 refs.]

II. WRAMBY, G. (1938). Paratyphus beim Fuchs. [**Fox Paratyphoid**].—*Dtsch. Pelztierz.* **13.** 356-359. 2 figs., 1 table.

III. POTEL, K. (1938). Enzootische Encephalitis bei jungen Silberfüchsen als Folge einer Paratyphusinfektion. [**Encephalitis in Young Foxes Following Paratyphoid Infection**].—*Z. InfektKr. Haustiere.* **53.** 88-105. 4 figs. [14 refs.]

I. An extract from an inaugural dissertation [*V. B.* **8.** 271].

II. This is a translation into German of a Swedish article [*V. B.* **7.** 576]. In an appendix, Dr SCHOOP gives a brief report of similar cases in Germany, and recommends vaccination combined with hygienic control.

III. In an epizootic of salmonella infection among young silver foxes, brain symptoms were observed such as " circling ", holding the head to one side or tilted backwards, etc. An increased vitamin content in the food caused no improvement. The Kiel type of *S.e.* Gärtner were isolated from the central nervous system in every case.

The histopathological picture practically corresponded with that of epizootic encephalitis in foxes. A marked infiltration of the connective tissue spaces by lymphocytes and plasma cells was observed in both the grey and white matter. Progressive changes took place in the neuroglial cells, which became clumped and massed. In nearly all cases this was accompanied by an inflammatory perivascular and tissue infiltration. The ganglion cells were not damaged ; only rarely was there brain haemorrhage, but the meninges were frequently affected.

—SASSENHOFF (MUNICH).

STOILOWA, E. R. (1938). Die Dotteragglutination bei der Kükenruhr. [**Yolk Agglutination in Bacillary White Diarrhoea**].—*Z. InfektKr. Haustiere.* **53.** 236-242. 1 table. [3 refs.]

Rapid aggl. tests were carried out on yolk from the ovaries of adult hens, on the yolk residue of hatched chicks, and on yolk from eggs incubated, 6, 18 and 21 days, in order to determine the presence of *Salmonella pullorum* infection. One drop of yolk in as fluid a state as possible, and free from clots, was emulsified and thoroughly mixed with 2 drops of test fluid ; best results were obtained at a temperature of 15-20°C. ; the suspension was made from 48-hour culture and was phenolized; it was filtered through cotton wool and heated in a water-bath at 60°C. for 3 minutes, and finally 0·3 c.c. of 1% crystal violet solution was added for every 10 c.c.

The results were checked by enrichment culture in tetrathionate broth. The rapid aggl. test and the culture test corresponded exactly in the case of hens and hatched chicks, but not so closely with hatching eggs.

POMEROY, B. S., & FENSTERMACHER, R. (1939). **Paratyphoid Infection of Turkeys.** —*J. Amer. vet. med. Ass.* **94.** 90-97. 3 tables. [10 refs.]

The authors describe the bacteriology of a considerable number of outbreaks of paratyphoid in turkeys. The investigations consisted of the bacteriological examination of turkey poults and of incubated eggs and the testing of blood sera for salmonella agglutinins. In the latter case the sera were first tested with whole blood *Salmonella pullorum* and *S. typhi-murium* plate antigens. Reactions to this test were then checked by the tube method with the following organisms :– *S. typhi-murium*, *S. pullorum*, *S. gallinarum*, *S. cholerae-suis*, *S. abortus-equi*, *S. enteritidis*, *S. paratyphi A* and *S. paratyphi B*.

The authors found from their investigations that *S. typhi-murium* may cause disease in turkey poults up to five weeks of age. They were able to isolate the same organism from infertile eggs and dead-in-shell embryos up to the 4th week of incubation. *S. typhi-murium* was also recovered from the ovary and oviduct of three out of ten naturally infected birds. The following organisms may also cause losses in turkey poults :– *S. anatum*, *S. newington*, *S. montevideo*, *S. derby*, *S. senftenberg*, *S. bareilly* and *S. bredeney*.—D. L. HUGHES.

STANDFUSS, R. (1938). Was leisten die gemischt-spezifisch-unspezifischen Sera für die Artbestimmung der Paratyphus-Enteritis-Bakterien? [**Differentiation of Salmonella with Mixed Specific and Non-Specific Sera**].—*Berl. Münch. tierärztl. Wschr.* November 4th. 678-679. [Also appeared in *Dtsch. tierärztl. Wschr.* **46.** 716-717].

In food inspection and meat inspection the rapid and accurate typing of salmonella is becoming increasingly important, but those engaged in such work have neither the facilities nor the time to prepare and use an endless number of pure type-specific and phase-specific sera. The author describes a method suitable for typing most of the common salmonella contaminants of food in which only six samples of antisera are required. These are mixed type and group sera of *S. brandenburg*, *S. paratyphi A*, *S. typhi-murium*, *S. cholerae-suis*, *S. enteritidis* and *S. newport*.—E. J. PULLINGER.

MEYER, K. (1938). Relations réciproques des facteurs antigéniques des *Salmonella*. [**Interrelations of the Antigenic Factors of Salmonella**].—*C. R. Soc. Biol. Paris.* **128.** 959-963. [1 ref.]

Having carried out experiments with the precipitation test, M. formed the opinion that the two somatic antigens IV and V of *Salmonella paratyphi* B appear to be components of a single molecule which maintain the same quantitative relations throughout. They are precipitated together by either a serum prepared against the somatic antigen IV or a serum prepared against V.—A. A. B. ELLIS.

ARCHER, G. T. L. (1938). **Some Observations on Salmonella Flagellar Antigens.** —*J. R. Army med. Cps.* **71.** 235-243. 5 tables. [4 refs.]

A. maintains that a number of organisms in the salmonella group have no true claim to be considered as separate species on the basis of their H antigens. Using *Salmonella typhi-murium*. var. *binns* and *S. suipestifer* (European), both of which are considered as monophasic in the group phase, A. claims that they contain dominant and recessive antigens, these terms not being used in the Mendelian sense. The dominant antigens in the above organisms are the group antigens, but they mask small amounts of specific antigens or recessive antigens. It is thus erroneous to consider them as monophasic. A. also considers that certain cultures may lack one or more of the normal antigenic components of the group phase, which are considered to be characteristic of the particular organism. [The original article should be consulted for details of technique].—D. L. HUGHES.

HERRMANN, W. (1939). Die Trennung von Mischkulturen und Phasen der Erreger der Typhus-Paratyphus-Enteritis-Gruppe mit der Schwärmplatte nach Sven Gard. [**The Separation of Mixed Culture of Salmonella by Sven Gard's Swarm Plate**].—*Zbl. Bakt. I.* (*Orig.*). **143.** 207-215. [6 refs.]

The description of a method by which the swarm colony technique can be adapted for the separation of two very similar motile organisms. If a mixture of two salmonella organisms is inoculated on to the middle of the surface of a plate of semi-solid agar containing H antibody specific for the one, then after incubation the other organism will be found in pure culture in the peripheral zone where swarming is taking place. The same technique can be applied for obtaining an organism in the type or group phase by incorporating phase specific serum in the medium. —E. J. PULLINGER.

DELPY, L., & RASTEGAR, R. (1938). Étude de souches américaines, asiatiques, et européennes de microbes du groupe *pullorum-gallinarum*. [**Study of American, Asiatic, and European Strains of** *Salmonella pullorum* **and** *S. gallinarum*].—*Ann. Inst. Pasteur.* **61.** 536-564. 4 figs., 6 tables. [Numerous refs.]

The authors studied strains responsible for fowl typhoid and bacillary white diarrhoea in Iran and other countries. They found only slight variation in their cultural and biochemical activities. On a cultural basis they recognize five types :– *S. gallinarum*, *S. pullorum* A, *S. pullorum* B, *S. intermedius* A, and *S. intermedius* B. Those strains isolated from chickens in Iran had all the characteristics of *S. pullorum* A. The authors found the use of brilliant-green agar, xylose, dulcite, maltose. and starch of primary importance in determining the five types.—A. A. B. ELLIS.

MARRIOTT, W. H. (1938). **Infectious Abortion of Cattle in Canada.**—*Canad, publ. Hlth J.* **29.** 266-269.

Marriott claims that brucella infection is of considerable importance from the economic standpoint and deals with this phase of the problem. Vaccines have not as yet been successful in controlling the disease. The method adopted by the Dominion Department of Agriculture to accomplish this task is the identification of infected animals by serological tests and the subsequent removal of reactors from the herd. The regulations set forth by the authorities for the application of this eradication plan are described in detail. The serological tests are conducted by the laboratories of the Health of Animals Division and certain other laboratories, and consist of a routine slow agglutination test, confirmed by rapid (plate) agglutination and complement fixation tests, a standard technique being used for all. The incidence of the disease in Canada varies; in the herds under the supervision in the Dominion it averages about 2%.—J. L. BYRNE.

GRYCZ, E., & TEKLIŃSKI, A. (1938). Nasilenie brucełozy bydla na podstawie dotychczasowych wyników masowego badania serologicznego. [**Distribution of Bovine Brucellosis as Shown by Large Scale Serological Tests**].—*Pam. pańs. Inst. nauk. Gosp. wiej. Puławy.* No. 2. pp. 56-57. 1 table. [Suppl. to *Wiad. weteryn.* **18.** No. 223].

A serological test for brucellosis was carried out in Poland, with the following results :– out of 185 herds comprising 10,108 cattle, the percentage of positive reactions was under 10% in 42 herds, between 10% and 25% in 30 herds, from 25-50% in 40 herds, and over 50% in 7 herds. In 66 herds the results were negative.

EHRLICH. (1938). Die bisherigen Erfahrungen mit der Durchführung des freiwilligen Abortus-Bekämpfungsverfahrens in der Provinz Hannover. [**The Voluntary Control of Abortion in the Province of Hanover**].—*Dtsch. tierärztl. Wschr.* **46.** 664-668. 2 tables.

A report of experiences gained during the course of the contagious abortion elimination campaign. In the initial herd tests it was found that a greater percentage of large herds were infected than small ones, whilst among the infected herds the percentage of infected animals was higher in the large herds. Comparing the relative values of the blood and milk agglutination tests over a series of 3,000 animals the following results were obtained :– in 89·6% of cases both blood and milk tests were negative, in 4·1% both these tests were positive, in 5·9% the blood test was positive and the milk test negative, and in 0·3% the blood test was

negative, and the milk test positive. [These results suggest that the milk agglutination test is almost valueless. When done as a supplement to the blood test it reveals an insignificant number of extra infected animals, whilst if used instead of the blood test about half the infected animals are missed].—E. J. PULLINGER.

KARSTEN. (1939). Die Bruzellose die Haustiere in Südwest-Afrika. [**Brucellosis in Domestic Animals in South West Africa**].—*Dtsch. tierärztl. Wschr.* **47.** 43-44.

K. claims that *Brucella melitensis* infection commonly occurs in cattle, goats and sheep in South West Africa and that man frequently contracts the infection from these animals. In order that farmers may safeguard themselves he makes the following recommendations :– (1) Those who have to handle animals which have aborted should afterwards wash in 2 % lysol; (2) byres and kraals contaminated with afterbirth and excretions should be limed ; (3) newborn animals should never be skinned, and no one with cut hands should act as butcher, and (4) cow's and goat's milk should not be used raw, and butter should not be made from unheated cream. [The occurrence of *Br. melitensis* in S.W.A. is of considerable interest as this infection is rarely if ever encountered in other parts of Southern Africa, though *Br. abortus* is a wide-spread infection and undulant fever in man caused by *Br.a.* is occasionally diagnosed].—E. J. PULLINGER.

SEELIG, Hildegard. (1938). Ueber die Peroxydasereaktion der Brucellen. [**On the Peroxydase Reaction of Brucella**].—*Inaug. Diss., Zürich.* pp. 55. 24 tables. [Numerous refs.]

The benzidin reaction was used in conjunction with acetate buffer at pH 4·0 to 5·0 to determine the production of catalase by 34 different strains of brucella of all three types (*melitensis*, *abortus* and *suis*). The reaction was inhibited by KCN or CO, but only when relatively large amounts were employed. The effect of heat on the reaction was found to vary greatly. It was not possible to differentiate between the three types by this reaction, but on the whole *Br.m.* was the strongest catalase producer.—P. S. WATTS.

I. YAMAMOTO, S. (1938). Ueber die durch Nekrosebazillen verursachten multiplen Leberabszesse der Rinder. [**Multiple Liver abscesses in Cattle Caused by the Necrosis Bacillus**].—*J. Jap. Soc. vet. Sci.* **17.** 40-49 of pt. 2. 6 figs. on 3 plates, 1 table. [13 refs.] [In German : Japanese summary pp. 212-213 of pt. 1].

II. YAMAMOTO, S. (1938). Ueber die Nekrobazillose des Hirsches. [**Necrobacillosis of Deer**].—*J. Jap. Soc. vet. Sci.* **17.** 36-39 of pt. 2. 6 figs. on 3 plates. [3 refs.] [In German : Japanese summary pp. 210-211 of pt. 1].

I. The author discusses 17 cases of multiple liver abscess in cattle. The abscesses generally varied in size from that of a hazelnut to that of a walnut and could be divided into two classes :– (1) those containing a firm central mass of necrotic tissue and (b) those without a firm central mass. From all cases *Fusiformis necrophorus* was isolated. A detailed description of this organism and of the histology of the lesions is given. There is progressive softening of the coagulated necrotic tissue from the periphery, inflammatory changes progress in surrounding tissues, and a fibrous capsule forms. In some cases reabsorption and organization progress and scar-tissue results. Necrotic nodules thus give rise first to form (a) and then to form (b) of the abscesses described.

II. A deer which died in a Japanese zoo had become weak and emaciated following an injury caused by the antlers of another animal about a year previously.

Autopsy revealed a diaphragmatic hernia, the major portion of the small intestine having passed into the thorax. The liver was enlarged, and many irregularly round or oval greyish-yellow necrotic foci were scattered through it, the lesions varying in size from that of a pea to that of a hazelnut. *Fusiformis necrophorus*, was isolated from these lesions. Detailed accounts are given of the histology of the lesions, and of the morphological, cultural, and other characteristics of the organism concerned.—H. E. HARBOUR.

KOBUSIEWICZ, T. (1938). Zakończenie masowego uodpornienia koni w wojsku przeciw tężcowi anatoksyną tężcową. [**Mass-Immunization of Horses with Tetanus Anatoxin in the Polish Army**].—*Wojsk. Przegl. weteryn.* **9.** 233-248. [8 refs.] [English and German summaries].

In the course of a general immunization against tetanus, 22,124 horses were inoculated once, 22,108 twice and 15,858 three times. Resting of horses on the day of inoculation is recommended, but this is not necessary provided there are no clinical symptoms. There were a certain number of local reactions, and in odd cases there was suppuration. Only three vaccinated horses developed tetanus.

The economical effect of the general immunization is not given. In some countries with a low incidence and mortality of horses from tetanus the expense of a general immunization is out of proportion to the actual economic losses from tetanus.—V. CHLÁDEK (PRAGUE).

TUNNICLIFF, E. A., & MARSH, H. (1939). **An Alum-Precipitated Toxoid as an Immunizing Agent against Infectious Necrotic Hepatitis (Black Disease) in Sheep.**—*J. Amer. vet. med. Ass.* **94.** 98-110. 10 tables. [12 refs.]

Infectious necrotic hepatitis has been recognized in western Montana. The disease appears to be identical with that which occurs in Australia, and the antigenic relationship between strains of *Clostridium oedematiens* from Australia and Montana has been established. The use of an alum-precipitated toxoid, prepared from a highly toxic strain of *Cl. oedematiens*, prevents loss from this disease in infected areas. In controlled experiments with g. pigs bacterin lacked immunizing value and immunity conferred by anaculture was considered to be derived from the toxoid rather than the anaculture.—A. A. B. ELLIS.

KALMBACH, E. R. (1939). **American Vultures and the Toxin of Clostridium Botulinum.**—*J. Amer. vet. med. Ass.* **94.** 187-191. 2 tables. [6 refs.]

American vultures (*Cathartes aura septentrionales* and *Coragyps atratus*) were found to resist several hundred thousand pigeon or mouse lethal doses of *Cl. botulinus* types A, B and C toxins when injected intraperitoneally or given *per os*. The serum of untreated vultures protected g. pigs and pigeons against approximately 2½ lethal doses of toxin, both when mixed with the toxin before injection and when injected separately but simultaneously. [Unfortunately very few animals were used in the experiments and the sera were not controlled by the use of sera from other species].—P. S. WATTS.

PATOCKA, F., & ILAVSKY, J. (1939). L'acide *l*-ascorbique et les anaerobies. [**Effect of L-Ascorbic Acid on the Cultivation of Anaerobes**].—*Ann. Inst. Pasteur.* **62.** 296-316. [Numerous refs.]

The effect of adding ascorbic acid to media was studied, cysteine media being used as controls. The following clostridia were tested: *Clostridium welchii*, *Cl. septique*, *Cl. oedematiens*, *Cl. gigas*, *Cl. haemolyticum*, *Cl. histolyticum*, *Cl. sporogenes*, *Cl. aerofoetidus*, *Cl. tetani*, *Cl. botulinum*, *Cl. putrificum*, *Cl. bifermentans*, and

Cl. tetanomorphum. In all, 35 strains were used. In liquid or solid media the growth of nearly all strains was improved by the ascorbic acid and in most cases made possible in aerobic conditions. It did not seem to favour toxin production unless glucose was also added, when a considerable increase in toxin was noted. The acid was found to lower the oxidation-reduction potential to an extent similar to that caused by cysteine, but the maintenance of the potential at the low level was longer.—P. S. WATTS.

SCHOFIELD, F. W. (1937). **A Case of Actinomycosis in the Horse.**—*Rep. Ont. vet. Coll. 1937.* pp. 12-13. 3 figs.

The infection originated apparently from the place of incision made for drainage of an abscess formed in the submaxillary lymph nodes of a young Clyde mare. Shortly after the wound closed a gradually increasing swelling filled the intermaxillary space. The actinomycotic character of the lesion was revealed by microscopical and histopathological examination.—H. KONST.

SCHOFIELD, F. W. (1937). **Suppurative Dermatitis due to Botryomycosis.**—*Rep. Ont. vet. Coll. 1937.* pp. 14-15. 1 fig.

Botryomycotic lesions involving the skin in the region of the shoulder and neck of an eight year old Clyde mare, were almost entirely lacking in the usual hyperplastic fibrous, fistulous character of this infection. In the slightly swollen skin there were scattered foci of granulation tissue, containing suppurating centres about the size of a hazel nut. Numerous dense granular bodies consisting of clusters of cocci were found in the pus.

Prompt recovery within three weeks followed the use of an autogenous bacterin.—H. KONST.

DISEASES CAUSED BY PROTOZOAN PARASITES

I. CHRISTOPHERS, S. R., & FULTON, J. D. (1938). **Observations on the Respiratory Metabolism of Malaria Parasites and Trypanosomes.**—*Ann. trop. Med. Parasit.* **32.** 43-75. 14 tables. [18 refs.]

II. FULTON, J. D., & CHRISTOPHERS, S. R. (1938). **The Inhibitive Effect of Drugs upon Oxygen Uptake by Trypanosomes** (*Trypanosoma rhodesiense*) **and Malaria Parasites** (*Plasmodium knowlesi*).—*Ibid.* 77-93. 9 tables. [13 refs.]

I. Oxygen uptake by trypanosomes ceases with deprivation of glucose, which results in loss of motility. Acid products are formed as the result of the metabolism of trypanosomes and the reduction in pH appears to be the cause of a gradual reduction in oxygen uptake. The ratio of glucose used and acid produced to oxygen uptake was about 1:1 and 2:1 respectively. No enzyme bringing about oxygen uptake could be detected, and it was confirmed that prussic acid has no inhibitory action on trypanosome respiration. Parasitic substance for malarial work was obtained by bleeding monkeys, defibrinating the blood and centrifuging it for 45 minutes at 2,000 r.p.m. ; the large forms separated as a brown layer above the red cell column. The oxygen consumption of this substance was peculiar in that the falling off with time was very small. There appeared to be no dependence on glucose consumption, though there was a rapid disappearance of sugar from the suspending fluid. The sugar content of a parasite mixture falls within an hour or two to the same value whether glucose is added or not. Prussic acid rapidly inhibits the oxygen uptake. It is thought that the parasites obtain oxygen from the oxyhaemoglobin of the red corpuscles.

II. A large variety of drugs were tested as to their power of inhibiting oxygen uptake, and drugs effective for the treatment of malaria or trypanosome infections were found to be more active than those having no therapeutic action. The greatest activity was found amongst the trivalent arsenical compounds acting on trypanosomes. The uptake of oxygen continued as long as the parasites were alive, and except that inhibiting drugs killed the parasites no detailed mechanism of their action could be detected. It is suggested that an estimation of the power of inhibiting oxygen uptake may prove to be a delicate method of testing drugs *in vitro* for their lethal activity.—U. F. RICHARDSON.

FRENCH, M. H. (1938). **Studies in Animal Trypanosomiasis. V. Some Disturbances of the Host's Carbohydrate Metabolism Induced by** *Trypanosoma congolense* **and** *Trypanosoma brucei*.—*J. comp. Path.* **51.** 269-281. 9 tables. [Numerous refs.] [See also *V. B.* **9.** 11 and 154].

A study was made of the variation in the blood during trypanosome infection in cattle, sheep and donkeys, in respect of the sugar content, carbon dioxide capacity and lactic acid content. The severity of the infection was judged by the degree of anaemia, the time of crisis being considered as the time when the red cell content of the blood was at its lowest.

In mild infections in which the host recovered spontaneously little abnormality could be detected except for some increase of the lactic acid content at the time of crisis. In fatal infections, or those in which the animals underwent a severe crisis but were saved by treatment, there was some fall in the CO_2 capacity when the parasites were circulating in the blood, an increase in the lactic acid content in the later stages, and a terminal hypoglycaemia. After crisis, or on treatment, there was a return to normal.

The various theories which have been put forward to explain the pathogenic action of trypanosomes are reviewed, and it is suggested that possibly a toxin is produced by trypanosomes or by their reaction with host tissue, and that the action may be similar to diphtheria toxin in interfering with the power of the liver to form glycogen from lactate. This would leave the blood lactic acid free to deplete the host's alkali reserve, and would explain the early development of acidosis, and the increase of lactic acid in the later stages. The blood sugar would remain normal as the glycogenolytic function of the liver would be normal. At the last stage, the lowered oxygen carrying capacity caused by the anaemia added to the exhaustion of the alkali reserve would break down the defence mechanism of the host, and the glycogenolytic function of the liver would be impaired through overwork so that a terminal hypoglycaemia resulted.—U. F. RICHARDSON.

HOARE, C. A., & BROOM, J. C. (1939). **Morphological and Taxonomic Studies on Mammalian Trypanosomes. VII. Differentiation of** *Trypanosoma uniforme* **and** *Tryp. vivax* **in Mixed Infections.**—*Trans. R. Soc. trop. Med. Hyg.* **32.** 629-632. 1 fig., 2 tables. [4 refs.]

Smears from a situtunga received for examination showed a trypanosome of the *vivax* group, but while the majority of the trypanosomes were small and conformed with the appearance of *Tryp. uniforme*, some of the forms seemed to be longer. The measurement of 100 individuals showed that the organisms fell into two groups; the distribution was bimodal (17μ and 24μ), there being a gap between the length measurements of the two groups. It is pointed out that had the measurement of individuals been confined to ten random measurements, as previously recommended [*V. B.* **9.** 12.], in six cases out of ten the decision would have been in favour of *Tryp. uniforme*, in one in favour of *Tryp. vivax* and in three

doubtful. Before coming to a definite decision as the result of the measurement of ten random individuals, it is necessary to ascertain that the infection is a pure one.—U. F. RICHARDSON.

IRIARTE, D. R. (1937). Contribución al estudio de la enfermedad de Chagas en Venezuela. [**Chagas' Disease in Venezuela**].—*Trabajos Cientificos.* pp. 135-213. 4 figs., 1 table. [Numerous refs.] [English summary]. Caracas: Editorial " Elite ". [8vo].

The reduvidid bug *Rhodius prolixus* is the vector of 60% of cases of Chagas' disease in man (*Trypanosoma cruzi* infection). Domestic animals as reservoirs of the virus are an important factor in the spread of the disease, particularly in areas where they live in close contact with man. I. gives details of histological studies of experimentally-infected rabbits and dogs, as well as details of electrocardiographic experiments upon infected g. pigs. A series of experimental inoculations of animals is described in detail. Dogs were found to be most susceptible; rats and g. pigs appeared to be less susceptible. A monkey and a squirrel showed no signs of infection 31 and 20 days respectively after inoculation, while a white rabbit and an armadillo died a few weeks after injection, no trypanosomes being present in the blood before death. Protective inoculation of human beings with Bayer 205 was ineffective. For diagnosis a complement-fixation test is used; an extract of spleen from puppies previously inoculated with heavy doses of *Tryp. cruzi* serves as the antigen.—J. PASFIELD.

POP, A., & OGNERU, D. (1937). Recherches sur la trichomonose bovine chez les vaches sacrifiées à l'abattoir municipal de Bucarest. [**Trichomonas Infection in Cattle Slaughtered at Bucharest Abattoir**].—*Arhiva vet.* **29.** No. 5. 12-25. 1 fig. [Numerous refs.] [In French: German summary].

Material from 273 cows was examined microscopically and culturally, and *Trichomonas genitalis* was isolated from the uterus in nine cases. In four of these cases the organism was isolated in pure culture; in five it was associated with coliform bacilli, staphylococci and streptococci.

I. BOULAY, P. (1937). Contribution à l'étude de la babésiellose bovine en France. [**Bovine Babesiellosis in France**].—*Thesis, Alfort.* pp. 90. 3 figs., 1 graph. [Numerous refs.]

II. CERNAIANU, C. (1937). Piroplasmes et piroplasmoses des animaux domestiques en Roumanie. [**Animal Piroplasmosis in Rumania**].—*Arch. roum. Path. exp. Microbiol.* **10.** 281-293. 1 text fig., 3 figs. on 3 plates. [Numerous refs.] [In French].

III. PIGOURY, L. (1938). Nouvelles identifications de piroplasmes du boeuf au Levant français. [**New Identifications of Bovine Piroplasms in the French Levant**].—*Bull. Soc. Path. exot.* **31.** 294-296. [3 refs.]

IV. DONATIEN, A. (1938). Les vaccinations contre les piroplasmoses bovines. [**Vaccination against Bovine Piroplasmoses**].—*Arch. Inst. Pasteur Algér.* **16.** 37-53.

I. The common cause of babesiasis in France is *Babesia bovis*, though another type, " *Babesiella* " *major*, has been described. The former occurs in all parts of France and is transmitted by *Ixodes ricinus.* Symptoms and P.M. appearances are described. Trypanblue is without effect in treatment, but gonacrine, trypaflavine, urotropine, ichthargan, and acaprin have each been successfully used. Two inoculation experiments are described, both of a benign character, and also a number of clinical cases. Mortality is said to occur in 5-6% of cases in France.

II. *B. bigemina* and *B. bovis* both occur in Rumania, the former being transmitted by *Boophilus calcaratus* and the latter by *I.r.* *B. bovis* is not found north of latitude 45° N., and the mortality in infected areas varies with the breed, and is more severe in dry summers. Both types of piroplasm may cause severe losses, however. The symptoms and P.M. appearances are described, and measurements of the parasites given. Trypanblue is without effect in the treatment of *B. bovis*, but urotropine, trypaflavine and acaprin are very useful in the treatment of both diseases if administered in the early stages of the attack. YAKIMOFF has described a type of *Babesia*, resistant to trypanblue and situated in the centre of the red corpuscles, and which he named *Françaiella.* Piroplasms of this appearance having been observed in Rumania, a blood film was forwarded and was confirmed by YAKIMOFF as containing only *Fr.* [= *Babesia*] *caucasica.* Similarly, in another outbreak, a piroplasm was observed resembling that described by SERJENT and other workers in 1926, and was confirmed by DONATIEN as *B. major.* It is intended to carry out further researches on these piroplasms.

III. The author describes a case of anaplasmosis in a native cow, due to *A. marginale.* Recovery took place after treatment with " zotheline ". In two separate outbreaks, *Th. mutans* was found associated with *B. bigemina* and *B. berbera* respectively. Symptoms were moderately severe, and the animals recovered without treatment. [The reason for assigning the name *Th. mutans* in place of *Th. annulata* is not clear].

IV. Four tick fevers of cattle are recognized in Algeria, *viz* :– true piroplasmosis (*B. bigemina* infection) babesiellosis (*B. berbera* infection) anaplasmosis (*A. marginale* infection) and theileriasis (*Th. dispar* infection). Dipping of cattle has not yet proved a practicable measure under local conditions. *Hyalomma mauritanicum*, which transmits *Th.d.*, is found in stables and not on pastures, and considerable protection can be afforded by the proper construction and maintenance of stabling. Injection of trypanblue is very effective in the treatment of true piroplasmosis, and ichthargan in that of babesiellosis. Gonacrine and also acaprin are useful in the treatment of both diseases. No drug has been found effective in the treatment of anaplasmosis or theileriasis ; vaccination has proved useful in these diseases and also against babesiellosis. A weak strain of *Th.d.* has been isolated, and is used for the inoculation of cattle ; this should be performed during March, as natural cases of infection occur in the summer. Protection against anaplasmosis is afforded by inoculation with *A. centrale.* It is also the custom in Algeria, as a matter of convenience, to include *B. berbera* at the same time in the inoculum. These inoculations are carried out in November, for if they are performed at the same time as those with *Th.d.*, acute attacks are liable to occur. Inoculations have now been carried out for a period of 12 years, on some 20,000 cattle. Losses occurring in the course of vaccination have varied in different years from 0·1% to 1·2%. It is dangerous to inoculate cows of improved breeds during the milking period. Vaccination is best performed on animals under 12 months old, and re-vaccination should be carried out annually.—S. J. GILBERT.

IDNANI, J. A. (1938). *Babesia bovis* **Starcovici, 1893, as the Cause of Red-Water in an Indian Buffalo.**—*Indian J. vet. Sci.* **8.** 99-101. 1 fig. on 1 plate. [4 refs.]

I. records the finding of *B.b.* in the blood of an indigenous buffalo housed with some European cattle. The animal developed haemoglobinuria, which failed to respond to treatment with trypanblue. Blood smears revealed small twin parasites which diverged widely and had a tendency to lie towards the periphery of the invaded cells. They conformed to the description of *B. divergens* as given

by M'Fadyean and Stockman [(1911). *J. comp. Path.* **24.** 340]. Attempts to transmit the disease to other buffaloes failed.—R. Fisher.

Hindmarsh, W. L. (1937). **Ulcerative Granuloma of Pigs. (Spirochaetal Tumours of Pigs).**—*Vet. Res. Rep., Dep. Agric. N.S.W. 1937.* pp. 64-70. 3 tables. [11 refs.]

This condition is often encountered among pigs in New South Wales principally in those reared under insanitary conditions. The lesions, which are characterized by the presence of ulceration of the skin and tumefaction of the subjacent and surrounding tissues, may be confined to the head (especially about the mouth) in very young pigs, but numerous circular ulcers are found on various parts of the body in older pigs. The predominating organism found in smears is a spirochaete, though its role in the causation of lesions has yet to be determined. Experimental transmission has not been successful. Natural infection appears to occur through various forms of trauma, *e.g.* dental eruptions in young pigs, injuries from barbed wire, etc. Treatment by the injection of an aqueous solution of 5% sodium arsenite into the lesions is effective as a curative measure, but prevention by improved sanitation will often eliminate the disease.—H. B. Carter.

Baker, D. W., & Stone, W. S. (1939). **A Study of *Spirillum ovis* Infection [Abortion] in a Group of Ewes Maintained under Observation for Two Successive Lambing Seasons.**—*Cornell Vet.* **29.** 32-34. [6 refs.]

Abortion due to a spirillum was diagnosed in a flock of ewes of which 24 aborted about a month before the full term of pregnancy. Autopsies on the lambs revealed necrotic areas in the liver, resembling the lesions produced by *Histomonas meleagridis* in turkeys. Histological examination of these liver lesions showed narrow areas of necrosis round the blood vessels, and a leucocytic infiltration. Pure cultures of spirilla were isolated from the liver lesions, heart blood and stomach contents of aborted foetuses. Farmers consider that ewes which abort will not breed again, but eight of the affected animals were bought, and served by a young ram next season; all eight lambed normally.—U. F. Richardson.

Delpy, L., & Rafyi, A. (1939). Sur la fièvre récurrente sporadique en Iran. Contribution à l'étude expérimentale de *Spirochaeta persica* Dschunkowsky, 1913. [**Sporadic Recurrent Fever in Iran Caused by** *S.p.*]—*Ann. Parasit. hum. comp.* **17.** 45-61. 3 figs., 5 tables. [5 refs.]

Although spirochaetal fever has been encountered several times in Iran amongst visitors to the country, it had not been recognized that a recurrent type of fever, not yielding to quinine, which occurs amongst natives in various areas was due to spirochaete infection. Five cases of infection were detected by microscopic examination of the blood, and an investigation was undertaken into the nature of the organism concerned. The parasite was considered to be *S.p.*, as although it was inoculable into g. pigs, it provoked no reaction. Infection was transmitted by *Ornithodorus tholozani.* The organism was inoculable to g. pigs, rabbits, rats, sheep and dogs, but in the last two species, although the blood was infective the parasite could not be detected in it. In rats it was found that parasites might persist in the brain for 285 days after recovery, but such persistence could not be detected in other susceptible animals. It is considered that the local persistence of infection is due to survival in the tick species, maintained by occasional infections of man and sheep.—U. F. Richardson.

I. SMITH, J. (1938). **Leptospiral Infections in Rats. The Presence of Specific Leptospiral Immune Bodies in the Serum and their Relationship to Carrier Conditions.**—*J. Hyg., Camb.* **38.** 521-526. 3 tables. [17 refs.]

II. SMITH, J. (1938). **Leptospiral Infections in Rats.**—*Rep. med. Offr Hlth, Aberd. 1937.* pp. 6-10. [3 tables.]

I. Rats caught in Aberdeen were killed by coal gas and examined for *L. icterohaemorrhagiae*; those which have been dead a few hours are unsuitable for examination, since the leptospira are destroyed. The kidneys were emulsified in saline and injected into g. pigs, which usually die in 7-12 days if leptospira are present. Blood taken from the heart of the rats was examined for immune bodies. Of 117 rats thus examined, 27·3% harboured virulent leptospira; immune bodies were found in the sera of 23·8% of these and in 17·9% of the group free from leptospira. A positive reaction in dilutions of less than 1:10 does not necessarily indicate a carrier of virulent leptospira. It was noted that the incidence of carriers and positive reactions increased with age.

Thirty-two rat strains from infected g. pigs were cultured and tested against a monovalent rabbit immune serum, but no substantial difference was found. No absorption tests were made.

II. This is the same as I.—H. E. BYWATER.

DISEASES CAUSED BY VIRUSES

BICHLMAIER. (1938). Maulseuche bei Pferden. [**Transmission of Foot and Mouth Disease to Horses**].—*Münch. tierärztl. Wschr.* **89.** 11-12.

Two horses pastured with affected cattle developed tongue lesions similar to those of F. & M. disease. No lesions, however, were present either on the mucosae of the mouth or lips, or in the feet and hoofs; externally the animals did not exhibit any symptoms of infection.

PICARD, J. H. (1938). Het voorkómen van panaritium en mastitis bij mond-en klauwzeer, door hygiënische en therapeutische maatregelen. [**Foot-Rot and Mastitis in Foot and Mouth Disease**].—*Tijdschr. Diergeneesk.* **65.** 550-555. [English, French and German summaries].

In cattle artificially infected with F. & M. disease, foot-rot and mastitis could be prevented by painting the interdigital space twice daily with a 10% alcoholic solution of iodine, and by washing the teats before and after milking with a 0·5% solution of NaOH.—JAC. JANSEN (UTRECHT).

RICHTER, W. (1938). Maul- und Klauenseuche Uebertragung auf den Menschen. [**Transmission of Foot and Mouth Disease to Man**].—*Arch. Derm., Berl.* **176.** 575-578. 2 figs.

A case record of infection of the mouth of a man by the virus of F. & M. disease transmitted by raw milk. Diagnosis was based on the effect of plantar inoculation of vesicle fluid into a g. pig.—J. E.

I. DE KOCK, G. (1938). **Foot and Mouth Disease.**—*Fmg S. Afr.* **12.** 337-338.

II. DE KOCK, G. (1938). **The Slaughter-Out Policy in Foot-and-Mouth Disease Control.**—*Ibid.* 379.

I. Reference is made to the outbreak of F. & M. disease in the Nqutu Reserve in Northern Natal, involving 17,000 cattle, mostly native-owned. The extreme mildness of the symptoms and absence of mortality are mentioned. At

the F. and M. Disease Station at Pirbright, England, it was found that the virus from Rhodesia, where it caused only a very mild disease, produced severe symptoms in English cattle. An appeal was made for the maintenance of the slaughter-out policy. An outbreak of F. & M. disease occurred in cattle at Satara in the Kruger National Park, but the opinion is expressed that it was probably not due to infection from the game.

II. An appeal is made to the stockowners in the Union to assist the Government in the diagnosis of the disease, so that it can be checked before it has become wide-spread. The value of the slaughter-out policy is emphasized, and reference made to the comparatively few outbreaks in Great Britain in 1937, when the disease was rampant on the Continent. Reference is made to the outbreak in cattle in the Kruger National Park.—E. M. ROBINSON.

I. CAMARA, A. (1938). Les méthodes d'inoculation virulente dans la prévention de la peste bovine. [**Live Virus Inoculation against Rinderpest**].—*Bull. Serv. zootech. Epiz. A.O.F.* **1.** No. 2. 1-12.

II. CURASSON, G. (1938). Notes sur la peste bovine. [**Notes on Rinderpest**].—*Ibid.* No. 3. 1-5. [2 refs.]

III. MORNET, M. (1938). Vaccination antipestique par le virus bilié. [**Rinderpest Vaccination with Virus in Bile**].—*Ibid.* No. 3. 6-8.

IV. CHARITAT, M. (1938). Vaccination par le virus pestique saponiné. [**Rinderpest Vaccination with Virus in Saponin**].—*Ibid.* No. 3. 9.

I. This is a discussion of various anti-rinderpest methods, and particularly of serum-virus inoculation, which is considered the best method for use in native areas. 3,777 inoculations carried out in Senegal are reviewed. Clinical reaction following serum-virus inoculation sets in on about the eighth day, but is delayed if virus comes from a donor in which gastro-intestinal lesions have already appeared. Ideally the reaction should be sharp, the febrile stage quickly passed, and no severe lesions produced. If appetite is lost for more than two days, or if diarrhoea commences, serum dosage is recommended, but is regarded as useless if diarrhoea has become profuse and foetid. Calves of a year or so are most susceptible, while very young calves are highly resistant. Abortion as a sequel to double inoculation appears to occur long after all clinical reactions have ceased, and C. moots the possibility that inoculation sets up, in the foetus, a disease process which leads to abortion 30-40 days later. C. considers that reduction of the virus dose from 1 c.c. to 0·5 c.c. produces milder reactions and lessens danger of abortion, without affecting development of immunity.

II. Normal ox bile, diluted 1:20 with saline, sterilized at 120°C., and filtered through a Seitz filter, was mixed in various strengths with the supernatant of a mixture of one part virulent spleen pulp and two parts saline. The mixture was inoculated immediately, or 6 or 12 hours after mixing. Results (on a small number of animals) showed that the bile-treated virus had an immunizing effect in some cases. It is not known whether the bile attenuates or kills the virus, or whether it acts by limiting the field of action of the virus in the body.

Accidents following vaccination and due to tetanus and other spore-borne infections are reported. Spores in accidentally contaminated spleens evidently existed in the vaccine. Deaths from other infections due to lowered resistance following vaccine-virus inoculations are also noted.

Attempts were made to establish the virus of rinderpest in the brain of a mouse (a) by inoculation of a small dose of immune serum prior to intracerebral injection of virus, and (b) by intraperitoneal injection of virus and simultaneous intracerebral injection of starch [see *V. B.* **4.** 32]. In neither case was virus recovered from the brain between the fourth and seventh days after inoculation.

III. One part diluted spleen pulp (virulent spleen pulp + 2 pts. saline) mixed with five parts diluted bile (bile and saline 1:10, sterilized at 120°C.) was inoculated into calves in doses of 2 c.c. and 10 c.c. (a) immediately after mixing, and (b) after 12 hours' storage on ice. Of eight animals tested, the blood of one receiving 10 c.c. of the stored mixture, and of one receiving 10 c.c. of the fresh mixture was proved virulent at the height of the reaction, yet these calves again reacted to a test dose of virus given at the 17th day. M. suggests that the virus was not sufficiently established in the body to give an immunity at the time of the test. Calves receiving 10 c.c. immediately after mixing did not develop rinderpest on testing with virus, but calves receiving only 2 c.c., or doses of stored vaccine, developed rinderpest on testing. Two cases were complicated by trypanosomiasis.

IV. Two calves received respectively (a) 2·5 c.c. of a saponin-virus mixture left for 30 minutes and (b) 5 c.c. of a saponin-virus mixture left for three hours. Neither calf reacted, and eight days after vaccination their blood was non-infective. In a second experiment two calves each received 4 c.c. of a saponin-virus mixture left for six hours. High fever and extensive oedema at the inoculation site were evident from the 2nd to the 4th days. The calves of both groups when tested with virulent blood 14 days after vaccination proved immune, while controls developed typical rinderpest.—H. E. Harbour.

Philippe, J. (1938). L'intradermoreaction dans la peste bovine. **[Intradermal Test in Rinderpest].**—*Bull. Serv. zootech. Epiz. A.O.F.* **1.** No. 4. 1-5. [13 refs.]

After a short review of the literature on allergic reactions in virus infections, P. describes his results with rinderpest, using animals which had been hyper-immunized for serum production. Two types of antigen were used :– (1) From blood, virulent defibrinated blood being mixed with an equal volume of castor oil or glycerin ; it gave no reaction in 12 animals. (2) From spleen, which was ground and filtered through two thicknesses of gauze and mixed with an equal volume of castor oil in 0·5 c.c. doses ; 21 out of 24 animals gave a positive reaction ; no controls were used. The intradermal reaction thus appears to be solely a test of immunity.—S. F. Barnett.

Pfaff, G. (1938). **Rinderpest : The Immunizing Value of Frozen Desiccated Goat Spleen.**—*J. S. Afr. vet. med. Ass.* **9.** 188-189. [5 refs.]

Goat vaccine is described ; it is made from spleen tissue and used in doses of 0·0025 g. Immunity is established in 48 hours and lasts at least 25 months. The cost worked out at about four shillings per 1,000 doses.—E. M. Robinson.

I. Feemster, R. F. (1938). **Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis.**—*Amer. J. publ. Hlth.* **28.** 1403-1410. 4 tables, 2 maps. [13 refs.]

II. Anon. (1939). **Equine Encephalitis in Man.**—*Ibid.* **29.** 272-274. [8 refs.]

I. The eight original cases were reported from Massachusetts ; all were due to the Eastern strain of the virus. The clinical and pathological findings from these cases are described fully, and appear to be characteristic of the disease.

II. Since eight cases of transmission of equine encephalitis to man were reported, further observations on the transmissibility of the disease have been made. Six more cases of human infection have occurred ; five of the patients had been in contact with horses, and serum from three of them neutralized the Western strain of the virus. The occurrence of the disease in ring-necked pheasants is reported, and it is suggested that birds are the chief agents of dissemination. This

theory is strengthened by the demonstration of artificial infection in ducks, geese, hawks and other birds, and the recovery of virus from a naturally infected pigeon.—D. D. OGILVIE.

McKENDRICK, A. G. (1938). **An Eighth Analytical Review of Reports from Pasteur Institutes on the Results of Anti-Rabies Treatment.**—*Quart. Bull. Hlth Org. L.o.N.* **7.** 1-42.

The statistics dealt with relate almost entirely to the year 1935, but a few earlier figures are reported. Tables are included giving data for the different methods used and results obtained at the different centres, mortality rate, racial incidence, species of biting animal, severity of bite, position of bite, delay in commencement of treatment, and paralytic accidents following treatment. Comparative percentage mortalities for all previous reviews are given at the end. Separate figures are given for the U.S.S.R.

PETRAGNANI. (1938). Protection contre la rage en Italie. [**Protection against Rabies in Italy**].—*Bull. Off. int. Hyg. publ.* **30.** 568-576. 5 tables.

In Italy there are 17 antirabic Institutes and 31 antirabic dispensaries. Except for the four institutes of Bari, Bologna, Naples and Ravenna, where Pasteur's method is still used, phenol vaccine is used all over Italy, and P. devotes much of his article to the advantages in economy, convenience and safety of the phenol vaccine compared with Pasteur's method. Immediately after the war a marked increase in the incidence of rabies was observed ; this was counteracted by strong measures against stray and improperly controlled dogs, which resulted in an immediate improvement. Tables and graphs are included ; these show the fall in the number of cases treated from 2,156 in 1933 to 1,750 in 1935, and a similar fall in the number of bites reported from 9,000 in 1925 to 5,000 in 1935 (approximate figures). The decrease between 1923 and 1935 in the number of cases diagnosed and the proportion found positive is given in a graph, and the number of stray dogs captured is shown to have fallen from 71,857 in 1930 to 47,744 in 1935. Both the number of cases reported, and the number unsuccessfully treated, show a slight increase in 1935 over 1934.

I. BLANC, G., & MARTIN, L. A. (1937). Recherches expérimentales sur la clavelée et la vaccination anticlaveleuse. [**Vaccination against Sheep Pox**]. —*Arch. Inst. Pasteur Maroc.* **1.** 721-764. 1 fig. on 1 plate, 2 tables, 4 graphs. [18 refs.]

II. BALOZET, L. (1938). Adsorption du virus de la clavelée par l'alumine hydratée. Virulence du complex. Application à la vaccination. [**Vaccination of Sheep with Sheep Pox Virus Adsorbed on Aluminium Hydroxide**]. —*C. R. Acad. Sci., Paris.* **207.** 349-351.

I. In order to produce a potent sheep pox antiserum, large amounts of virus are required. BORREL's method [*V. B.* **5.** 559.] of injecting virus into the peritoneal cavity produced inconstant results in Moroccan sheep. Attempts to infect monkeys, dogs and g. pigs by the same route were unsuccessful, while rabbits were refractory to intraperitoneal, conjunctival, intracerebral and intrapulmonary injections. The donkey, on the other hand, proved to be susceptible and fairly large amounts of virus could be obtained. The sera of recovered donkeys possessed a relatively high antibody content.

For the vaccination of sheep in the field the authors prepare a mixture of virus with a hyper-immune serum, the value of which has been accurately determined by titrating serial amounts on the skin of sheep. The virus was rendered inert

by bile but the value of such inactivated preparations for immunizing purposes was not tested. Attempts at conserving the virus in the dry state were unsuccessful.

II. Sheep pox virus was adsorbed on aluminium hydroxide. It was found that the virus was so firmly fixed to the gel that it could not be eluted with Na_2HPO_4 or NaCl solutions. Sheep inoculated with the aluminium precipitate showed a slight reaction only and were subsequently immune to sheep-pox.—R. E. GLOVER.

I. DELAGE, B. (1937). Recherches sur le serum sanguin chez la génisse au cours de la maladie vaccinale. **[Chemical Composition of Bovine Serum following Infection with Vaccine Virus].**—*Bull. Soc. Chim. biol., Paris.* **19.** 1407-1418. 5 tables. [4 refs.]

II. AKAZAWA, S., & HOTTA, T. (1938). **Experiments on Animals with the Small-Pox Virus with Special Reference to Vaccination.**—*J. Jap. Soc. vet. Sci.* **17.** 241-255 of pt. 1. 8 figs. on 2 plates, 1 chart. [9 refs.] [In Japanese : abst. from English summary pp. 112-113 of pt. 2].

I. The blood sera of cattle which had received large doses of vaccine virus by the intradermal route, were examined chemically at varying intervals after infection. The levels of urea, chloride and total protein remained reasonably constant, but the lipoids showed a very regular reduction to about a half the usual amount. The loss was related chiefly to the unsaponifiable fractions and not to the fatty acids.

II. Material from two smallpox patients was successfully transmitted to the monkey, rabbit, dog and g. pig, whereas calves, sheep and cockerels were not affected. After passage through rabbit testicles the virus produced lesions on the skin of calves.—R. E. GLOVER.

HAMMON, W. D., & ENDERS, J. F. (1939). **A Virus Disease of Cats, Principally Characterized by Aleucocytosis, Enteric Lesions and the Presence of Intranuclear Inclusion Bodies.**—*J. exp. Med.* **69.** 327-352. 6 figs. on 1 plate, 6 tables. [12 refs.]

An acute rapidly fatal epizootic disease of cats is described. Initial signs are limited to anorexia, weakness, and occasional vomiting, but a moderate fever and a leucopenia rapidly intervene. The latter is of such severity that in many cases no leucocytes can be detected in the blood shortly before death. Autopsy shows little of note except slight inflammation of the small intestine, and marked softening of the marrow of the long bones. Under the microscope intranuclear inclusions are conspicuous in the cells of the intestinal mucosa, and in the mononuclear cells in the spleen and lymph nodes. Marked aplasia of the cellular elements of the bone marrow is also characteristic.

The disease, which appeared in the first instance as an enzootic amongst laboratory cats, was studied experimentally by the inoculation of bacteria-free filtrate of spleen emulsions of infected cats into healthy cats. The mortality was high in the test cats. A few, however, showed no indication of illness other than moderate leucopenia, and it is thus possible that a mild infection may occur naturally.

Experimental and collateral evidence indicate that a filterable virus is the most probable cause. Inoculation into experimental animals has shown that the pathogenicity of the infective agent is confined exclusively to cats.

A comparison is drawn between the disease under investigation and cat distemper. It is suggested that the main points of differentiation lie in the mildness of the intestinal injury, the presence of inclusion bodies and the leucopenia.
—D. D. OGILVIE.

HURST, E. W. (1938). **Myxoma and the Shope Fibroma. 5. Myxoma in the Fibroma-Immune Rabbit, with a Summary of Present Knowledge of the Relationship between Myxoma and Fibroma Viruses.**—*Aust. J. exp. Biol. med. Sci.* **16.** 205-208. [15 refs.] [See also *V. B.* **9.** 391].

H. describes the histological changes observed in 12 rabbits infected intradermally with myxoma at intervals of 2-65 days after inoculation with fibroma virus. The disease produced was clinically and pathologically recognizable as myxoma, but differed from that in animals not immune to fibroma in that it exhibited many of the features of an allergic reaction, and also in the lack of histological changes in the spleen and distant lymph nodes.

GILDMEISTER, E., & AHLFELD, I. (1938). Ueber eine bei der weissen Maus spontan aufgetretene Meningo-Enzephalomyelitis. [**Spontaneous Meningo-Encephalomyelitis in White Mice**].—*Zbl. Bakt. I. (Orig.).* **142.** 144-148. 3 figs., 2 tables. [5 refs.]

The report of a spontaneous outbreak of a disease in white mice which was characterized by bilateral posterior paralysis followed by death in 3-26 days. Histological examination revealed the presence of a meningo-encephalomyelitis and associated necrosis of ganglion cells. The cause was shown to be a filtrable virus and the disease could be reproduced by the intracranial inoculation of brain filtrate. The virus could be demonstrated for some time after in the brains of animals which survived attacks of the disease, so that recovered carriers probably play a big rôle in the spread of this disease.—E. J. PULLINGER.

PIGOURY, L., & BERNARD, M. (1939). Existence de *Rickettsia canis* dans le proche-orient. [**Existence of *R.c.* in the Near East**].—*Bull. Soc. Path. exot.* **32.** 19. [1 ref.]

Attempts to demonstrate *R.c.* infection of dogs in Beyrouth were made from 1937 onwards. No infection could be detected in dogs brought for general treatment, but out of 46 stray animals destroyed, one showed inclusion bodies in the monocytes of the lungs, similar in morphology and staining characteristics to *R.c.* as described by DONATIEN and LESTOQUARD [*V. B.* **8.** 354].—U. F. RICHARDSON.

ZINSSER, H., FITZPATRICK, Florence, & WEI, H. (1939). **A Study of Rickettsiae Grown on Agar Tissue Cultures.**—*J. exp. Med.* **69.** 179-190. 3 charts. [11 refs.]

Tissue cultures by the Maitland method has been used successfully in vaccination against the European type of typhus, but for large scale vaccine preparation, the method is slow and difficult. It was found that the optimum conditions for the development of rickettsia were provided when tissue cells could be preserved viable for 10 days without too active metabolism. Agar slants were prepared by mixing equal quantities of 3% agar with a Tyrode-serum mixture (300 c.c. double strength Tyrode solution, 200 c.c. horse serum and 16 c.c. of 0·04% solution of phenol red). The water of condensation was removed by pipette, and sterile minced tunica vaginalis of a g. pig gently laid on the surface of the agar slant, so that about 1/3 of the surface was covered.

For examination of cultures for rickettsia, smears were stained with 0·25% basic fuchsin, which was washed off with 0·5% citric acid ; the smears were then counterstained with 1% aqueous solution of methylene blue for 10 seconds. The rickettsia stain red and the cell elements blue.

Inoculation of g. pigs with such cultures has always produced typical and severe febrile reactions and 13 out of 18 animals later proved immune to inoculation

with typhus virus. Vaccines prepared by treating the cultures with formalin or phenol gave g. pigs complete immunity or increased resistance. The cultures gave a much better yield of rickettsia than Maitland cultures.—U. F. RICHARDSON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

HEARLE, E. (1938). **Insects and Allied Parasites Injurious to Livestock and Poultry in Canada.**—*Fmrs Bull. Dep. Agric. Can.* No. 53. pp. 108. 83 figs.

This is intended to replace a previous bulletin (No. 29, 1923). It embodies recent advances in knowledge of this subject, largely based on H's late studies and investigations, and is prepared to serve the needs of livestock owners in all parts of the Dominion. It is profusely illustrated, and commences with reasons for, and general methods of, control; the role of insects as carriers of worms is mentioned, with reference to the dung beetle. Sections devoted to flies occupy nearly half the bulletin, the remainder deals with ticks, lice, mange and other mites, and is followed by a "Monthly Program of Live Stock Insect and Arthropod Control".—C. MACKIE.

HINDMARSH, W. L., & BELSCHNER, H. G. (1937). **Studies on Cutaneous Myiasis (Blowfly Strike) of Sheep. I. Glycerine Diborate as a Preventive of Blowfly Strike of Sheep.**—*Vet. Res. Rep., Dep. Agric. N.S.W. 1937.* pp. 41-43. 3 tables. [2 refs.]

BELSCHNER, H. G., & HINDMARSH, W. L. (1937). **Studies on Cutaneous Myiasis (Blowfly Strike) of Sheep. II. The Ingestion of Boric Acid as a Means of Prevention of Blowfly Strike in the Breech Region.**—*Ibid.* pp. 44-48. 1 table. [3 refs.]

BELSCHNER, H. G., & HINDMARSH, W. L. (1937). **Studies on Cutaneous Myiasis (Blowfly Strike) of Sheep. III. The Operative Procedure for the Control of Blowfly Strike of the Breech of Sheep (Mules' Operation).**—*Ibid.* pp. 49-57. 8 tables. [5 refs.]

I. The trial suggests that a glycerine diborate preparation may be valuable as a dressing for the prevention of blowfly strike in sheep. Since the experiment was conducted in a year when blowfly strike was moderate it is not known whether this treatment would be useful when fly attack is severe.

II. Boric acid administered in the drinking water had no apparent value in preventing blowfly strike in sheep. No ill effects on body weight or general health were observed.

III. The experiment showed clearly that the surgical removal of folds from the breech does render sheep less liable to blowfly strike in that region of the body. The authors consider that the gradual reduction of breech wrinkles by breeding is the more desirable method of lowering susceptibility to blowfly strike.—H. B. C.

SONI, B. N. (1938). **Observations on the Bionomics of the Ox Warble-Fly (*Hypoderma lineatum* de Villiers).**—*Indian J. vet. Sci.* **8.** 375-380. 3 figs., 2 tables. [6 refs.]

Observations were made on *Hypoderma lineatum* at Muktesar in the Kumaun Hills at an altitude of 7,500 feet. This species must be indigenous, as cattle bred in the district were found to be infested with the grubs. In hill bulls, the infestation exceeded 50%. Oesophageal forms of the larvae were found continuously from March to October; this observation does not support the view that there is only

one annual brood of *H. lineatum* in India. Records of body weights indicated that the presence of warble tumours causes loss of condition in affected animals.

—R. P. Hobson.

Gunn, W. R. (1938). **[Report on] Warble-Fly and Tick Control-Work [in British Columbia, 1937].**—*Rep. Dep. Agric. Brit. Columbia, 1937.* pp. K67-K68.

A review on warble-fly control in British Columbia by treatment (undisclosed) during 1937 in which satisfactory progress is reported. In the control of the wood tick (*Dermacentor andersoni*) and the winter tick (*D. albipictus*) the use of " standardized Derris " was found to be more efficacious, particularly against the winter tick, than insecticides previously used.—L. M. Heath.

Popescu-Baran, M. (1939). Presence de larves d'Hypoderma bovis, au second stade d'évolution, dans le canal rachidien de la génisse. **[The Presence of Second Stage Larvae of *Hypoderma bovis* in the Spinal Canal of a Heifer].** —*Rev. Med. vet., Bucuresti.* **51.** 44-46. [In French].

Larvae found in the spinal canal of a heifer were identified as second instar larvae of *Hypoderma bovis*. Except for one previous record of the presence of second instar larvae in the spinal canal of an ox, little is known of the early stages of larvae of this species. This discovery is held to confirm the theory that the larvae are ingested and do not perforate the skin.—R. P. Hobson.

Abdussalam, M. (1939). **The Occurrence of Equine Nasal Bot, Rhinoestrus Purpureus (Brauer, 1858) in India.**—*Vet. J.* **95.** 36-38. [11 refs.]

Larvae of *Rhinoestrus purpureus* were found in the nasal sinuses of a donkey. This appears to be the first record both of this species as a parasite of the donkey and of the occurrence of the genus *Rhinoestrus* in India. Since in this case the host was born locally, the fly is presumably able to breed in India.—R. P. Hobson.

Wells, R. W., & Knipling, E. F. (1938). **A Report of Some Recent Studies on Species of *Gastrophilus* Occurring in Horses in the United States.**—*Iowa St. Coll. J. Sci.* **12.** 181-203. 17 figs. [12 refs.]

Keys are given for the identification of first and second instar larvae and adults of the four species of *Gastrophilus* known to infest horses in the United States. The biology of the three principal species, *G. nasalis* L., *G. intestinalis* De Geer and *G. haemorrhoidalis* L., is described, an account being given of the data available and the author's observations on the following points :– seasonal activity of adults, mating and oviposition, incubation period and hatching, larval movements and development, and pupation. In the case of *G. intestinalis*, observations were made on the endurance of the larva within the eggshell, the seasonal occurrence of larvae in the tongue of the horse, and the use of chemicals as a substitute for the warm-water method of destroying the eggs. Washes containing phenol or cresol proved ineffective, but an oil derived from the distillation tars of corncobs was found to kill more than 90% of the eggs. Special methods are described for collecting *Gastrophilus* eggs and for transplanting immature larvae into living horses.—R. P. Hobson.

Causey, O. R. (1938). **Experimental Intestinal Myiasis.**—*Amer. J. Hyg.* **28.** 481-486. 1 table. [5 refs.]

In view of numerous cases of digestive disturbance in man attributed to intestinal myiasis, tests were made by feeding of the following to dogs and cats :–

Drosophila melanogaster, *Lucilia sericata*, *Phormia regina*, *Cochliomyia macellaria* *Sarcophaga securifera* and *Calliphora erythrocephala*. In no case could living larvae be discovered afterwards in the large intestine or faeces. C. concludes that these fly larvae do not produce symptoms such as have been attributed to them.

—M. L. Bingham.

Sybesma, R. P. (1938). Schurftbestrijding bij onze huisdieren. [**Sarcoptic Mange in Domestic Animals**].—*Tijdschr. Diergeneesk.* **65.** 158-163. [English, French and German summaries].

S. states that sarcoptic mange is common in animals in the Netherlands. He also states that it is a menace to human beings, though no evidence is given to support this statement. He describes treatment of animals with a commercial petroleum product.—Jac. Jansen (Utrecht).

Abdussalam, M. (1939). **On a New Feather Mite Parasitic on the Indian Domestic Fowl** (*Gallus Bankiva Murghi*).—*Vet. J.* **95.** 39-42. [7 refs.]

A. states that the mite is a species of the genus *Rivoltasia* ; he calls it *Rivoltasia karamellahiei*, and gives a description of the male and female. No ill effects were observed in the chickens infested. The mite was discovered in Muktesar, in the Kumaon Hills, India.—A. L. Wilson.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

I. Schmid, F. (1938). Parasitäre Aufzuchtkrankheiten und ihre Bekämpfung. [**Control of Diseases of Young Stock Due to Parasites**].—*Dtsch. tierarztl. Wschr.* **46.** 785-787.

II. Schmid, F. (1938). Therapie des parasitären Krankheiten der Haustiere. [**Therapy of Parasitic Diseases in Domestic Animals**].—*Ibid.* 760-762.

I. A brief account of the parasitic diseases of young stock.

II. A general discussion of the more common parasitic diseases and their treatment.—A. L. Wilson.

Rayski, C. (1938). Przyczynek do znajomości robaków pasożytniczych lisów srebrzystych w Polsce. [**Parasitic Worms of Silver Foxes in Poland**].—*Wiad. weteryn.* **17.** 281-290. 1 table. [12 refs.] [French summary].

Silver fox farming is rapidly developing in Poland, and severe losses are caused by helminth infestation. The following were the results of the examination of 45 silver foxes :– *Toxocara canis* in 33 foxes, *T. mystax* in 3, *Uncinaria stenocephala* in 25, *Capillaria plica* in 1, and *Metorchis albidus* in 20. R. discusses the customary control measures.

Gebauer, O. (1939). Statistische Beobachtungen über den Milchertrag während einer Lebèregelseuche. [**Milk Yield (of Cattle) During Liver Fluke Infestation**].—*Wien. tierärztl. Mschr.* **26.** 33-38. 6 graphs.

G. discusses the loss of milk yield in cattle caused by infestation with liver flukes, and states that this loss can be as much as 15%.—A. L. Wilson.

Ganslmayer, R. (1938). Rezultati terenskih pokusa sa bakrenim sulfatom obzirom na djelovanje na metiljskog puza. [**Results of Copper Sulphate Spraying of Land Infested with Liver Fluke Snails**].—*Vet. Arhiv.* **8.** 193-225. 12 figs. [German summary]. [See also *V. B.* **8.** 708].

Fifty-seven field experiments were made with copper sulphate against liver

fluke snails. It was observed that the character and area of the land was a factor demanding consideration when preparing copper sulphate solutions. For 1 hectare of land, 30 kg. copper sulphate are required if to be used as a 1-4% spray, and 45 kg. if scattered as a powder consisting of six parts of sand to one of copper sulphate. The total cost would amount to between 19s. and 30s. per hectare in Yugoslavia. As a rule the concentration obtained in marshes must not fall below 1:25,000 in places with an abundant vegetation, or 1:50,000 in barren areas.

—B. Oswald (Križevci).

Lavier, G., Leroux, R., & Callot, J. (1938). Un cas de cancer multicentrique du foie associé à la distomatose hépatique chez un mouton. [**Carcinoma Associated with *Fasciola* and *Dicrocoelium* Infestation of the Liver in a Sheep**].—*Ann. Parasit. hum. comp.* **16.** 424-428. 2 text figs., 1 fig. on 1 plate. [14 refs.]

The authors review the literature associating neoplasms with parasitism of the liver of cattle and sheep. The article concerns a sheep's liver of which parts were enlarged and studded with small nodules. The large bile ducts contained several *Fasciola* and all the small ducts appeared to contain *Dicrocoelium*.

The authors conclude that the *Dicrocoelium* are more likely to have been cancer-producing than the *Fasciola*. [The organ was examined without any knowledge of the sheep's history ; as the liver is so often passaged by other parasites, especially larval forms, the assumptions outlined in the article scarcely seem warranted].—C. V. Watkins.

Seyfarth, Martha. (1938). Pathogene Wirkung und innerer Bau von Paramphistomum cervi. [**Pathogenic Action and Inner Structure of *Paramphistomum cervi***].—*Dtsch. tierärztl. Wschr.* **46.** 515-518. 7 figs. [6 refs.]

A large number of parasites was found in the rumen of a calf, and the wall of the organ was inflamed. Other calves in the same herd had become so emaciated as a result of infestation with this parasite that they had to be destroyed. The author describes the digestive, excretory and reproductive systems of the parasite.

—A. L. Wilson.

I. Bhalerao, G. D. (1937). **Schistosomes and Schistosomiasis in India.**—*Papers on Helminthology commemorating 30 year Jubilee of K. J. Skrjabin.* pp. 47-54. [Numerous refs.] [In English : Russian summary]. Moscow : Lenin Acad. Agric. Sci. [Reprinted in *Indian J. vet. Sci.* **8.** 149-157].

II. Dowdeswell, R. M. (1938). **Schistosomiasis in the Kavirondo District of Kenya Colony.**—*Trans. R. Soc. trop. Med. Hyg.* **31.** 673-688. 2 text figs., 2 figs. on 1 plate, 5 tables. [Numerous refs.]

I. A short résumé is given of the work done in India on schistosomes and schistosomiasis. The condition occurs in ruminants, horses, pigs and dogs in India. The intermediate hosts of the parasites, the larval forms, medicinal treatment, immunity, and pathogenicity, are discussed.

II. Central Kavirondo is an area with a particularly high incidence of human infestation with these parasites. The disease is not known to occur in domestic animals in this district, and, indeed, only two cases have been recorded from the whole of the colony. D. records the discovery of the molluscan hosts of *S. haematobium* in Kavirondo. *S. bovis* was encountered in the course of the researches, and its intermediate host was found to be *Physopsis nasuta*. Furcocercariae obtained from this snail were allowed to infect mice, which on being killed 60 days later were found to contain many adult *S.b.* The characteristic

lesion was a tumour-like mass in the bladder ; this may indicate that the parasite is capable of affecting the genito-urinary system.

No ova of *S.b.* were found, however, on examination of numerous samples of urine from human beings.—D. D. Ogilvie.

Ciurea, I. (1934). Recherches expérimentales sur la réceptivité des oiseaux domestiques à l'infestation par les trématodes de la famille " Heterophyidae " Odhner. [**Susceptibility of Domestic Birds to Infestation by Trematodes of the Family Heterophyidae**].—*Mém. Prof. Jean Cantacuzene.* pp. 169-183. 5 figs. on 1 plate. [3 refs.] Paris : Masson et Cie.

Experiments to determine the receptivity of domestic birds to trematodes from fish were carried out on hens, guinea fowl, turkeys, ducks, geese and pigeons. The fish used came from the Danube, the Dniester and the Black Sea, and the birds were infested by giving them small whole fish or their various organs to eat, or by force-feeding them. The number of metacercariae in the fish were not estimated before feeding them to the birds.

Results showed that pigeons could be infested by all the trematodes fed to them, *viz* :– *Metagonimus romanicus* ; *Apophallus muhlingi* ; *Rossicotrema donicum* ; *Cryptocotyle concavum*, and *Pygidiopsis genata*. Hens and turkeys could be infested with *Cryptocotyle concavum*, but only for a few days. Guinea-fowl could be infested with *Cryptocotyle concavum*, *Pygidiopsis genata* and *Parascocotyle sinoecum*, and ducks and geese with *Cryptocotyle concavum* and *Pygidiopsis genata*. It is suggested that receptivity or non-receptivity to infestation should not be considered as being due to immunity or resistance to infection, but rather to the chemical metabolism of the digestive tract which may vary in different species of birds.

The trematodes from the Danube fish were most often found in the posterior third of the intestine of the birds, those from the Black Sea fish were most often found in the anterior and middle thirds.

I. Parlier. (1938). La ladrerie bovine à Dakar. [**Bovine Cysticercosis at Dakar, Senegal**].—*Rev. Méd. vét., Toulouse.* **90.** 504-515. 1 table.

II. Endrejat, E. (1938). Statistisches über die Rinderfinne im Iran. [**Statistics of Bovine Cysticercosis in Iran**].—*Dtsch. tierärztl. Wschr.* **46.** 472.

I. Tapeworms are more frequent in the natives than in Europeans, despite the fact that all native food is subject to long cooking. About 2% of cattle are infested with cysts due to pasturage in the neighbourhood of native dwellings where contamination with human faeces is high. Control is effected by :– (1) inspection of carcasses and total condemnation if the cysts are generalized ; (2) roasting of the meat until the whole flesh becomes greyish-red in order to kill all cysts (cysts are killed at temperatures above 48°C.), and (3) teaching the natives hygienic disposal of faeces.

II. About 7% of inspected cattle were found affected. Sites in order of frequency were :– masseters, lungs, heart, and intercostal, shoulder, and thigh muscles. The incidence is high despite the thorough cooking of food and the teaching of public hygiene. Control is by :– (1) inspection and partial or total condemnation of affected meat, since sterilization by heat, pickling or freezing cannot be used, and (2) treatment of human tapeworm carriers.—S. F. Barnett.

Bearup, A. J., & Morgan, E. L. (1939). **The Occurrence of Hymenolepis diminuta (Rudolphi, 1819) and Dipylidium caninum (Linnaeus, 1758) as Parasites of Man in Australia.**—*Med. J. Aust.* Jan. 21st. 104-106. 1 table. [Numerous refs.]

Three additional cases of *H. diminuta* infestation of man are reported. Two

cases of *D. caninum* infestation are recorded and are thought to be the first described from man in Australia. References to *D. caninum* in man have been collected.
—H. McL. Gordon.

Nosik, A. F. (1937). K voprosu ob ustoĭčivosti ličinočnyh (puzyrnyh) form ehinokokka k vozdeĭstviiu nekotoryh fizičeskih i himičeskih faktorov. [**On the Resistance of Larval Echinococci against Some Physical and Chemical Agents**].—*Papers on Helminthology, Commemorating 30 Year Jubilee of Prof. K. I. Skrjabin.* pp. 427-428. Moscow: Lenin Acad. Agric. Sci.

As a result of his experiments, N. concludes that *Echinococcus* has little resistance to salting, desiccation, and hot and cold water.

I. Roubaud, E., & Deschiens, R. (1939). Capture de larves infestieuses de nématodes pathogènes par des champignons prédateurs du sol. [**Capture of Infective Larvae of Pathogenic Nematodes by Parasitic Fungi of the Soil**].—*C. R. Acad. Sci., Paris.* **208.** 245-247. [5 refs.]

II. Roubaud, E., & Descazeaux, J. (1939). Action de certains champignons prédateurs sur les larves des strongylidés du cheval. [**Action of Certain Predatory Fungi on the Larvae of Equine Strongyles**].—*Bull. Soc. Path. exot.* **32.** 290-294. 2 figs. on 1 plate. [2 refs.]

III. Comandon, J., & de Fonbrune, P. (1939). De la formation et du functionnement des pièges de champignons prédateurs de nématodes. Recherches effectués à l'aide de la micromanipulation et de la cinématographic. [**Function and Formation of Fungi Traps Pathogenic for Nematodes. Use of Micromanipulation and the Cinematograph in their Study**].—*C. R. Acad. Sci., Paris.* **208.** 304-305. [3 refs.]

I. Since various soil fungi are known to capture and digest free-living rhabditid larvae, the authors wanted to ascertain if such fungi have the same action on parasitic nematode larvae. They found that when larvae of *Strongyloides fülleborni* (from chimpanzees) and *Ancylostoma duodenale* were placed in a Petri dish of sterile gelatine on which the fungi were cultured, the larvae were engulfed and digested by the mycelium. Application of these results to the destruction of parasitic nematode larvae in manure is suggested.

II. The fact that the free-living larvae of species of *Ancylostoma* and *Strongyloides* can be captured and destroyed by the fungi *Arthrobotrys* and *Dactyella* was used as a basis for similar experiments with the strongyle larvae of the horse. The larvae, which were obtained from cultures of strongyle eggs in finely powdered charcoal, were placed with the fungus on nutritive gelatin at 18°C. It was found that *D. bembicoides*, *D. ellipsospora* and *A. oligospora* can capture and digest the strongyloid larvae of *Strongylus* and *Trichonema* genera to a variable degree. It is suggested that a new biological method of control against parasitic nematodes can be based on the utilization of these predatory agents.

III. Micromanipulation of the surface of fungi traps with a blunt needle causes a swelling of the surface cellules and an alteration in osmotic pressure, or, in some cases, the production of a sticky substance at the point of irritation. The characters of these phenomena can be recorded with the cinematograph.
—M. L. Bingham.

Wetzel, R., & Enigk, K. (1937). Ein weiterer Beitrag zur Lungenwurmfauna des Hochwildes. [**The Lungworms of Game Animals** (*Dictyocaulus*)].—*S.B. Ges. naturf. Fr. Berl.* Jan. 19th. 9-10. [5 refs.]

The authors state that *D. filaria* occurs very rarely in deer and is probably introduced by sheep. They describe the occurrence of *D. viviparus* in several bison.—A. L. WILSON.

HUYGHENS, F., & LEFEVRE, A. (1938). La bronchite vermineuse. **[Verminous Bronchitis]**.—*Ann. Méd. vét.* **83.** 145-156.

A conventional account of the subject.—C. V. WATKINS.

DAVTJAN, E. A. (1937). K izuceniiu biologii legočnogo gelminta ovec i koz Synthetocaulus kochi Schulz, Orloff et Kutass, 1933. **[A Study of the Life-Cycle of *Synthetocaulus kochi* Schulz, Orloff and Kutass, 1933, the Lungworm of Sheep and Goats]**.—*Papers on Helminthology, Commemorating 30 Year Jubilee of Prof. K. J. Skrjabin.* pp. 105-122. 4 figs., 3 tables. [5 refs.] Moscow: Lenin Acad. Agric. Sci.

The incidence of *Synthetocaulus* in Armenia is high compared with that of *Dictyocaulus*. Infective larvae can survive for as long as four months outside the host. Exposure to a temperature of from −6° to −10°C. kills them in five days, but heating to 50-60°C. kills them in 30 minutes. They show a high resistance to desiccation; dried on a watch glass they are viable for 120-122 days at room temperature (18-25°C.) and for 30-32 days at 37·5°C. Pellets of faeces containing infective larvae dried at 37·5°C. still contain viable larvae after 100 days. Direct sunlight (35-52°C.) kills desiccated larvae in 5-8 hours; larvae in a moist medium (30-42°C.) are stimulated in the first hours to active mobility, but they die in from 6-10 hours.

The authors found the resistance of *Synthetocaulus* larvae to chemical agents to be comparatively high; they give figures showing the relative resistances of *Synthetocaulus* and *Dictyocaulus* larvae to various agents.

Experiments on direct infection (*per os*) of rabbits with *Synthetocaulus* larvae gave negative results; the larvae passed through the bowels unchanged, emerging in a viable condition.

Snails of the genera *Helix*, *Limax*, *Burinus* and *Hyalina* are the intermediate hosts of *Synthetocaulus*, and the development of the larvae in this host takes some 35-60 days.

TRAVASSOS, L. (1937). Revisão da familia Trichostrongylidae Leiper, 1912. **[Revision of the Family Trichostrongylidae]**.—*Monogr. Inst. Oswaldo Cruz.* No. 1. pp. vii + 512. 297 plates. [Numerous refs.] Rio de Janeiro: Instituto Oswaldo Cruz. [4to].

T. has revised and modified previous publications on this family; papers already published in the *Memorias do Instituto Oswaldo Cruz* on *Haemonchus* and on *Trichostrongylus* have not been repeated, but references to them are given in the appropriate places. The system of nomenclature is given shortly, followed by descriptions of the worms. Nearly half the book is made up of drawings of the worms, a bibliography, and an index.

HABERER, C. (1938). La strongylose gastrique du cheval. Trichostrongylus axei (Cobb.). **[Gastric Infestation of Horses with *Trichostrongylus axei*]**.—*Thesis, Alfort.* pp. 58. 2 figs. [Numerous refs.]

A general account of the condition.—A. L. WILSON.

CHANDLER, Asa C. (1938). **Further Experiments on Passive Immunity of Rats to *Nippostrongylus* Infections**.—*Amer. J. Hyg.* **28.** 51-62. 2 figs., 2 tables. [9 refs.]

Rats were repeatedly exposed to large numbers of *Nippostrongylus* larvae by

skin penetration or subcutaneous inoculation, and it was found that when their serum was injected intraperitoneally into young rats, worms from a test infection were markedly inhibited in egg production and slightly dwarfed in size. The serum had very little effect on the larvae which had already reached the intestine and passive immunity did not last for longer than two weeks. Subcutaneous inoculation of living larvae was more effective than the skin penetration method in producing an antiserum, but inoculation of killed larvae introduced by the same route was not effective. The immunity is directed against metabolic products of the larvae rather than against the larvae themselves.—A. L. WILSON.

OTTO, G. F., & KERR, K. B. (1939). **The Immunization of Dogs against Hookworm,** *Ancylostoma caninum*, **by Subcutaneous Injection of Graded Doses of Living Larvae.**—*Amer. J. Hyg.* Sect. D. **29.** 25-45. 2 tables, 4 graphs. [Numerous refs.]

Three litters of dogs, a total of 10 animals, were used to demonstrate the difference between the active immunity to the hookworm resulting from serial light infections in puppyhood and the partial refractoriness of mature dogs to initial infections. At autopsy many more parasites were found in the unprotected controls than in the dogs actively immunized as puppies. Furthermore, with one exception, the unprotected controls all succumbed to the experimental infections, whereas the actively immunized animals were scarcely affected. The authors conclude that maturity and general good health are essential for the host to respond fully and quickly to the stimulus provided by invading worms.—A. L. WILSON.

ERSOV, V. S. (1937). K voprosy o borjbe so strongyloidozom teljat jagnjat, porosjat i zerebjat. [**Control of Strongyloidosis of Cattle, Sheep, Pigs and Horses**].—*Papers on Helminthology Commemorating 30 Year Jubilee of Prof. K. J. Skrjabin.* pp. 155-159. 1 table. Moscow: Lenin Acad. Agric. Sci.

A general account of *Strongyloides* infestation; there is no new material.

BARNET, G. (1937). Un cas de sétariose oculaire. [**A Setaria in the Eye of a Mule**].—*Rev. Méd. vét., Toulouse.* **89.** 224-226.

A male *S. equina* 5 cm. long was removed from the anterior chamber of the right eye of a mule in Algeria. B. speculates as to the way in which the worm penetrates the aqueous humor. The life-history of the worm is inknown.

HUTSON, L. R. (1938). **Some Observations on Manson's Eyeworm of Poultry in Antigua, B. W. I., and a Suggested Method of Control.**—*Trop. Agriculture, Trin.* **15.** 66-68. 2 tables. [3 refs.]

Removal of the membrana nictitans of chickens as a method of control of *Oxyspirura mansoni* has given promising results. Membranectomized and control birds were infected by placing larvae in the eyes, or feeding with larvae or infested cockroaches. Adult worms were recovered from all of the controls, but the membranectomized birds remained uninfected. Mature adult worms set up considerable irritation in the eyes of the treated birds, but disappeared within 24 hours.—D. D. OGILVIE.

IMMUNITY

FOLLIS, R. H., Jr. (1938). **Immunizing Effect of Old Tuberculin on Experimental Tuberculous Infection.**—*Proc. Soc. exp. Biol., N.Y.* **39.** 45-48. [8 refs.]

Thirty g. pigs were divided into three groups; 10 were inoculated with old

tuberculin, 10 with synthetic medium (*i.e.*, medium only), and 10 were untreated. All the g. pigs then received inoculations of virulent tubercle bacilli. The tuberculin treated g. pigs did not react to the tuberculin test 42 days later, whereas the animals in the other two groups gave positive reactions. G. pigs of all groups were found to be affected to the same extent when killed. Old tuberculin conferred no demonstrable immunity.—J. Reid.

I. Parish, H. J. (1938). **The Modern Outlook on Tuberculin.**—*Tubercle, Lond.* **19.** 337-350. [Numerous refs.]

II. Bunney, W. E., & Gottschall, R. Y. (1938). **The Standardization of Diluted Tuberculin.**—*Proc. Soc. exp. Biol., N.Y.* **39.** 71-75. 1 table. [8 refs.]

I. This valuable article is essentially a critical review which does not lend itself to abstraction and should, therefore, be read in the original.

P. summarizes recent investigations into the preparation and purification of tuberculin with special reference to P.P.D., and indicates the advantages of the latter as a diagnostic agent in man. The tuberculin test in cattle and pigs using synthetic medium products is also mentioned, together with a brief summary on the experimental investigation into BCG and Spahlinger vaccine in both man and cattle.

II. With the object of detecting loss in potency of 1:10,000 dilutions of synthetic medium tuberculin, B. has devised a slightly more sensitive test than those used by Eagleton and Baxter [(1923). *Brit. J. exp. Path.* **4.** 289.] and by Douglas and Hartley [*V. B.* **5.** 568]. G. pigs weighing from 700-1,400 g. were selected and were sensitized with 0·5 mg. of *Mycobact. tuberculosis* H.37. The animals attained maximum sensitivity after four weeks and reacted to dilutions of tuberculin varying from 1:10,000 up to 1:80,000 or even higher. It is claimed that with these extremely allergic animals it is possible to detect differences in potency of 20% as compared with the standard.—R. E. Glover.

Feldman, W. H., & Fitch, C. P. (1937). **Development of Local Cellular Reaction to Tuberculin in Sensitized Calves.**—*Arch. Path.* **24.** 599-611. 10 figs. [7 refs.]

A detailed study of the histological changes produced by intradermal injection of tuberculin into the caudal folds of nine calves artificially infected with virulent bovine tubercle bacilli. Sections of caudal fold were taken for examination at intervals up to 28 days after inoculation.

The main changes noted were perineural and perivascular cellular reactions, oedema, thrombosis and endarteritis, with pronounced infiltration of polymorphonuclear leucocytes in the early stages of reaction, these being later replaced by eosinophils, histiocytes or mononuclear lymphocytes. Evidence of reaction was found to be still present 28 days after inoculation.

Intradermal injection of tuberculin into the caudal folds of non-sensitized calves did not produce any demonstrable reaction.—H. Burrow.

I. Belle, G. (1938). Quel protocole adopter pour les tuberculinations à dose double ? [**The Reading of the Tuberculin Test Using Double the Usual Dose**].—*Bull. Acad. vét. Fr.* **11.** 487-489.

II. Belle, G. (1938). Remarques à propos de l'injection de tuberculine à dose double. [**Tuberculin Tests Using Double the Usual Dose**].—*Maroc méd.* **18.** 384-386.

I. From the intensity and duration of the reaction in 336 positively reacting

cattle injected with double the usual dose of tuberculin [apparently the subcutaneous test], B. considers that this is preferable to the usual dose, and that the injection is best given at 10 p.m., the test being read at 6 a.m.

II. This article expands I [above] and gives graphs to show that :– (a) the reaction usually occurred by the 10th hour after injection ; (b) the duration of the temperature rise rarely exceeded eight hours ; (c) the rise was usually between 1·5° and 2·5°C. ; (d) the maximum temperature recorded was usually between the 12th and 14th hour.—P. S. WATTS.

I. SABIN, Florence R. (1938). **Cellular Reactions to Tuberculo-Proteins Compared with the Reactions to Tuberculo-Lipids.**—*J. exp. Med.* **68.** 837-852. 12 figs. on 2 plates, 3 tables. [Numerous refs.]

II. SABIN, Florence R., & JOYNER, A. L. (1938). **Cellular Reactions to Defatted Tubercle Bacilli and their Products.**—*Ibid.* 853-868. 6 figs. on 2 plates, 3 tables, 1 chart. [Numerous refs.]

I. Normal and tuberculous rabbits and g. pigs were inoculated with the three fractions of tuberculo-protein, the soluble precipitate, freshly prepared precipitate and the more insoluble protein. In normal animals proteins in solution induced new formation of monocytes. Freshly prepared precipitate activated the monocytes and epithelioid cells formed small tubercles. There was a complex cellular reaction to the insoluble protein, monocytes and macrophages were stimulated, both the epithelioid type and the foreign body type of giant cell were formed, and epithelioid cells were either in tubercles or scattered diffusely.

Introduction of the three tuberculo-protein fractions into tuberculous animals provoked greatly enhanced cellular reactions compared with those in normal animals. Tuberculo-lipids caused relatively simple reactions involving mainly epithelioid cells. The histological changes as illustrated by the plates are fully explained.

II. The chemical procedures used to obtain the materials from the tubercle bacilli are outlined in the chart and the writers discuss these methods of producing fractions of tubercle bacilli. The cellular reactions in experimental animals to defatted tubercle bacilli and the residue after treatment with 25% alcohol were similar to those reactions produced by heat-killed organisms. Abscesses were formed, and tubercles of monocytes and epithelioid cells ; giant cells contained masses of bacilli and neutrophiles infiltrated the tubercles. The defatted bacilli lack lipids removable by alcohol, ether and chloroform but contain the firmly bound lipid which can be resolved into hydroxy acid and polysaccharide. The hydroxy acid gives rise to foreign body giant cells and the tissues become invaded with eosinophiles. The polysaccharides call neutrophiles from the blood stream. The reactions to the unfiltrable lipid include those of both its constituents.—J. REID.

BEERENS, J. (1939). Apparition de lésions intestinales chez le cobaye par inoculation de tuberculine dan les ganglions mésentériques. **[Intestinal Lesions in G. Pigs after Injection of Tuberculin into the Mesenteric Lymph Nodes].** —*C. R. Soc. Biol. Paris.* **130.** 126-128.

Fifteen healthy and 15 tuberculous g. pigs each received 0·05 c.c. of tuberculin, undiluted or diluted to 1:10, into an ileo-caecal lymph node. P.M. examination 2-20 days after inoculation revealed no lesions in the healthy g. pigs, while 14 of the tuberculous g. pigs showed several necrotic ulcers (2-4 mm. in diameter) involving part or whole of the thickness of the caecal wall. Histologically these ulcers consisted of areas of fibrinous necrosis surrounded by young granula-

tion tissue. Injection of tuberculin into the intestinal wall caused necrosis only at the site of injection.—R. O. MUIR.

CALMETTE, A. (1934). La sensibilité tuberculinique (ou allergie). Ses rapports avec l'infection tuberculeuse et avec l'état d'immunité conféré par le vaccin B. C. G. [**Tuberculous Allergy and its Connexion with Immunization by BCG**].—*Mém. Prof. Jean Cantacuzène.* pp. 108-109. [3 refs.] Paris: Masson et Cie.

C. discussed the meaning of the terms allergy and anaphylaxis and gave his own definitions, especially in regard to bacterial infections. He did not agree with the view that individuals immune to tuberculosis are also necessarily allergic, and that there is no immunity without allergy. Cattle injected with weak doses of virulent tubercle bacilli do not show allergy for some weeks. Until that state is developed they react in this respect to virulent superinfections as if they were immune.

The so-called anergizing factors, as for instance ultra-violet radiations, inhibit allergy but do not influence immunity. The allergic state can also be removed by accustoming the body to progressive doses of tuberculin, although resistance to superinfections is not impaired.

Allergy is an indication of the existence of an infection, but not of immunity. Tuberculous allergy only appears when the symbiosis of the bacilli with the macrophages has formed the " elementary tubercle " or " tuberculocyte ", and, in BCG vaccination, when the organisms have become established in the body ; it disappears when BCG ceases to survive.

A state of allergy does not give any indication of the benignity, gravity, localization, age or actual state of the infection.

BELLER, K. (1939). Allergie und allergische Krankheiten. [**Allergy and Allergic Diseases**].—*Tierärztl. Rdsch.* **45.** 63-68. 5 figs.

The text of a lecture delivered at a post-graduate veterinary course. B. gives a comprehensive account of the growth of knowledge on antibodies, natural and acquired immunity, and allergy, giving examples of how these operate in animal disease.—J. E.

PRIESTLEY, F. W. (1938). **Some Observations on the Phagocytosis of Br. Abortus by Polymorphonuclear Leucocytes.**—*Vet. Rec.* **50.** 1793-1797. 1 fig., 3 tables. [13 refs.]

P. retested Huddleson's technique [*V. B.* **8.** 233.] and found that the density of the suspension was of primary importance. No differentiation into positive or negative could readily be made unless suspensions of a density of Brown tube 15 were employed. It is shown that the phagocytosis test is a more delicate indication of the presence of antibody than the agglutination test, and that the phagocytosis is due to a specific antibody present in the plasma. Non-virulent *Br.a.* organisms were not more readily phagocytised than virulent organisms.—P. S. WATTS.

MIR-DAMADI, M. (1937). La brucellose. Le séro-diagnostic rapide. [**Rapid Serological Diagnosis of Brucellosis**].—*Thesis, Alfort.* pp. 90. [Num. refs.]

A description of brucellosis in animals and man. Some personal observations in comparing the rapid and tube methods of agglutination and the complement-fixation test showed agreement in 97 % of the tests performed. The sero-flocculation test gave variable results. There is no new information.—S. J. GILBERT.

NÉLIS, P. (1938). Les corps gras et la production des agglutinines anti-Bang. [**Fats and the Formation of Anti-Brucella Agglutinins**].—*C. R. Soc. Biol. Paris.* **128.** 597-599. [4 refs.]

Twelve rabbits were divided into three groups, and all of them received subcutaneous injections of 2 c.c. of a mixture containing *Br.a.* organisms. The mixture given to the first group was made up from 1 c.c. of a heat-killed suspension of *Br.a.* and 8 c.c. of normal saline ; that given to the rabbits in the second group was from 1 c.c. of a live suspension of *Br.a.* incubated with 8 c.c. of a vaseline-lanoline mixture at 37°C. for 24 hours, and the third group of rabbits received injections from a mixture composed of 1 c.c. of a live suspension of *Br.a.* incubated with 8 c.c. of cod liver oil at 37°C. for 12 hours. The data in a table giving the agglutinating titres of the sera of the three groups after 60 days indicate the agglutinogenic value of the bacilli killed by cod liver oil or vaseline-lanoline, compared with heat-killed bacilli.—R. O. MUIR.

WINTER, A. R. (1939). **Whole Blood Pullorum Studies.**—*Poult. Sci.* **18.** 26-30. 1 table. [6 refs.]

W. summarizes the results of agglutination tests on about 6,000 birds by various techniques. There was about 99% agreement between the tube test (serum 1:50 dilution) and the whole blood plate test, if the flock infection was low. When the infection was high in a small group of birds, there was only 87% agreement, the tube test appearing more reliable for bloods of low aggl. titre. Substitution of serum for whole blood in the plate test proved less efficient, but raising the temperature for conducting the test to 90°F. as compared with 40°F. did not affect results, but merely shortened the time of agglutination. Some form of agitation of the plate was found essential for the efficiency of the plate test.

Comparison between two proprietary stained antigens was made, one of these proving more serviceable when reading the whole blood test in poor light. The influence of certain diets on the reading of this test was also investigated, but no results are given.—C. V. WATKINS.

TRUCHE, C. (1934). Les différents diagnostics de la pullorose. [**Diagnosis of Bacillary White Diarrhoea**].—*Mém. Prof. Jean Cantacuzène.* pp. 739-754. [Numerous refs.] Paris : Masson et Cie.

The aetiology of B. W. D. and methods that have been tried for its diagnosis are reviewed, for example by using pullorin [*V. B.* **2.** 323]. T. describes a method of serum agglutination using living cultures in Martin's broth medium diluted with physiological saline. The birds are bled after fasting for 24 hours.

CHAPMAN, G. H., & LIEB, C. W. (1937). **The Use of Leuco Triphenylmethanes as Reagents for Bacterial Polysaccharides. (Preliminary Report).**—*Stain Tech.* **12.** 15-19. 1 table. [2 refs.]

It was observed that when an acidulated solution of leuco methyl violet was added to suspensions of staphylococci, deep blue or violet colours were produced. Further investigations showed that the active ingredient of the bacterial suspension was a bacterial polysaccharide, and that in addition to leuco methyl violet (hexamethyl triaminotriphenyl methane), leuco malachite green (tetramethyl diaminotriphenyl methane) and derived reagents gave a similar reaction. The authors suggest that these triphenylmethanes might be considered to meet the need of a reagent for detecting and estimating bacterial polysaccharides without having to hydrolyse them before testing.

CAMERON, G. D. W. (1938). **Seasonal Variation in Response of Guinea Pigs to Toxoid.**—*Canad. publ. Hlth J.* **29.** 500-503. 4 tables. [6 refs.]

Confirmatory evidence is presented that the immunity response in g. pigs to diphtheria toxoid, as measured by the Schick test, shows a seasonal fluctuation. This response in summer is fairly high but uniform, while the winter-spring percentages differ widely. This variation might suggest that diet is an important factor, as during the summer an adequate supply of green feed is available.

—D. G. MCKERCHER.

KHOÏ, N. D. (1939). Recherches sur la valeur antigénique des différentes fractions chimiques du bacille tuberculeux vis-à-vis du sérum sanguin et du liquide pleural des tuberculeux. [**Antigenic Value in Complement-Fixation Tests of Different Chemical Fractions of Tubercle Bacilli against Infected Blood Serum and Pleural Fluid**].—*C. R. Soc. Biol. Paris.* **130.** 215-217. 2 tables. [3 refs.]

Complement-fixation tests were carried out with six different antigens, prepared from the lipoid, lipo-protein and polysaccharide-protein fractions of the tubercle bacillus, against the blood serum of 25 tuberculous patients and the pleural fluid from seven cases of tuberculous pleurisy, using Besredka's technique. Antibodies for the lipoids, appeared to predominate in both blood serum and pleural fluid. In 20% of the sera and 50% of the pleural fluids, in addition to the antibodies for lipoids, antibodies were demonstrated which reacted with the polysaccharide-protein antigen.—R. O. MUIR.

SCHAEFER, W., & SANDOR, G. (1939). Mise en évidence d'un anticorps protéidique vrai dans le sérum d'un cheval préparé avec des bacilles bovins dysgoniques lisses. Sa séparation des anticorps lipoïdiques et polyosidiques. [**Demonstration of a True Protein Antibody in Horse Serum Prepared with Smooth Dysgonic Bovine Tubercle Bacilli. Separation from the Lipoid Antibodies and Polyosidic Antibodies**].—*C. R. Soc. Biol. Paris.* **130.** 155-159. [6 refs.]

Complement-fixation tests were performed against various tubercular antigens with horse serum prepared by intravenous injections of heat-killed smooth dysgonic bovine tubercle bacilli. The antigens employed were the following :- phosphotungstic tuberculin (from a Vallée bovine strain and consisting purely of proteins and proteoses) ; proteins precipitated by saturation of human or bovine cultures with ammonium sulphate and containing 25% of reducing substances ; purified proteins reprecipitated by trichloracetic acid and free from reducing substances ; polysaccharides precipitated by 50-80% methyl alcohol from the residue after protein extraction, and lipoids extracted by alcohol from tubercle bacilli. By specific inhibition of the different antibodies, this antibacterial serum was shown to contain entirely distinct antibodies for proteins, polysaccharides and lipoids.

—R. O. MUIR.

GORECZKY, L., & VON LUDANY, G. (1938). Ueber die bakterizide Fähigkeit des Milzdepotserums. [**The Bactericidal Power of Spleen Depot Sera**].—*Z. ImmunForsch.* **94.** 45-48. 1 table. [9 refs.]

Working with dogs, the authors showed that blood serum collected from the spleen is about 30% more effective in immobilizing *Salmonella typhi*, *Vibrio cholerae*, staphylococci and *Bacillus anthracis* than is serum from the peripheral circulation. They speak of the serum from spleen blood as " depot serum " and emphasize its protective action ; they argue that the well-recognized ability of the spleen to filter bacteria from the circulating blood and to retain them is due largely to the immobilizing action of this depot serum.—E. J. PULLINGER.

DISEASES, GENERAL

WYSSMANN, E. (1938). Der Meteorotropismus des bösartigen Katarrhalfiebers. **[The Influence of Season and Weather on Bovine Malignant Catarrh].**—*Schweiz. Arch. Tierheilk.* **80.** 517-524. 2 tables, 4 graphs.

Statistical stock insurance reports for the years 1932, 1933 and 1937, concerning 400 fatal cases of bovine malignant catarrh, revealed a maximum incidence during spring and summer (66%), with a marked falling-off in August. Occasionally numerous cases occur after a drop in temperature and an increased humidity. The observations are incomplete, as only fatal cases are reported. W. believes the malady to be a typical infectious disease closely related to certain climatic conditions, lowering of the bodily resistance being the actual inciting cause. He puts forward three hypotheses dealing with alkalosis, the operation of undefined electric phenomena, and changes that may develop in the autonomic nervous system.
—V. CHLÁDEK (PRAGUE).

I. RIMINGTON, C., ROETS, C. G. S., & FOURIE, P. J. J. (1938). **Quantitative Studies upon Porphyrin Excretion in Bovine Congenital Porphyrinuria (Pink Tooth) No. 1.**—*Onderstepoort J. vet. Sci.* **10.** 421-429. 2 figs., 1 appendix. [20 refs.]

II. FOURIE, P. J. J., & RIMINGTON, C. R. (1938). **A Further Case of Congenital Porphyrinuria (Pink Tooth) in a Living Grade Friesland Cow in South Africa. (Cedara Case).**—*Ibid.* 431-436. 4 figs. [2 refs.]

I. Quantitative porphyrin determinations were made of faecal and urinary porphyrin from two bovines with congenital porphyrinuria for periods varying from 3 to 6 days at different times of the year. The authors found that :– (1) the porphyrin excretion from an animal varies from day to day ; (2) there appears to be no correlation between excreted uroporphyrin, urinary coproporphyrin and urine volume ; uroporphyrin and coproporphyrin seem to run a parallel course in the urine ; (3) there seems to be a relationship between faecal coproporphyrin and faecal weight ; (4) the highest porphyrin excretion recorded from one animal during 24 hours was 1·27 g., and (6) in the urine of one animal the ratio of coproporphyrin I to coproporphyrin III was 27·6:1. Uroporphyrin I and III and coproporphyrin I and III were identified.

II. This so-called Cedara case is described as a further case of congenital bovine porphyrinuria (pink tooth) in a Friesland cow which produced a healthy, clinically normal calf ; this is the first affected cow known to have produced a calf.

MOON, V. H. (1937). **Shock, Its Mechanism and Pathology.**—*Arch. Path.* **24.** 642-663 and 794-813. 1 fig. [Numerous refs.]

This is a review of the historical and current theories of shock arising as a result of trauma or surgical interference. Several of the proposed explanations have lacked confirmation by subsequent investigation. The results of experiments and observations made in testing theories leads M. to define shock as " a circulatory deficiency, not cardiac and not vasomotor in origin, characterized by decreased total blood volume, decreased volume flow and by haemoconcentration ". It would appear that the circulatory deficiency results from stasis, leakage and dilatation in the capillaries caused by the effects on their walls of substances absorbed from the injured tissues. The evidence does not support the idea that local loss of blood at the site of injury is an adequate explanation for shock, although such loss contributes to the circulatory deficiency.—N. J. SCORGIE.

BOERNER, F. (1938). **Changes in the Blood Cellular Elements in Relation to Diagnosis and Prognosis.**—*J. Amer. vet. med. Ass.* **93.** 303-306.

A general discussion on the use of haematological methods in diagnosis and prognosis. The article contains nothing that is new.—D. L. HUGHES.

OPPERMANN, T. (1938). Die Haematologie im Dienste der Bekämpfung der Aufzuchtkrankeiten. [**Haematology in the Control of Breeding Diseases**]. —*Dtsch. tierärztl. Wschr.* **46.** 774-776. 4 figs., 1 table.

Breeding diseases associated with over or under feeding are discussed. Cases of hyperprotinaemia in three-year-old horses are described in detail. The main finding was a low blood albumin-globulin ratio.

With regard to breeding diseases of the cow, cases of sterility have been investigated in which weak or irregular periods of oestrus occur without any detectable change in the genital tract. Pathological change in the blood was demonstrated by the " guttadiaphot " technique [*V. B.* **4.** 398.], a distinct " halo " being produced. The albumin ratio was also changed. These changes in the blood have been produced experimentally by intensive feeding with soya bean meal. In 63 cases of trichomonas infection, 29 showed a low haemoglobin content of the blood and an increased phosphorus content.

Forms of sterility and abortion in the sheep due to under-nourishment are described ; both are characterized by alteration in the albumin:globulin ratio.

—A. T. PHILLIPSON.

DAM, H., & GLAVIND, J. (1938). **Alimentary Exudative Diathesis.** [**Correspondence**].—*Nature, Lond.* **142.** 1077-1078.

A preliminary note on the occurrence of an accumulation of fluid in the subcutaneous connective tissue of chicks fed on an experimental diet in which the protein had been extracted by alcohol. There also occurred hyperaemia and leucocytosis, chiefly in the subcutaneous fat tissue. It is suggested that this exudative diathesis is a deficiency disease and attempts are being made to find the protective factor, which probably occurs in dried alfalfa.—N. J. SCORGIE.

GUENTHER, D. F. (1938). Vergleichende Studie zur kausalen und formalen Genese der Gallensteine bei Mensch und Tier. [**Genesis of Gall Stones in Man and Animals**].—*Tierärztl. Mitt.* **19.** 896-898. [Numerous refs.]

G. states that present day knowledge about the formation of gall stones is derived entirely from human medicine. In man three types are recognized, (a) calcareous pigmented stones containing cholesterol, (b) pure cholesterol stones, which always occur singly, and (c) calcareous stones pigmented with bilirubin. Infection of the gall bladder and obstruction to the flow of bile are considered to be the two main factors concerned in their production. With infection the desquamated epithelial cells etc. form the nucleus of the stones. The aetiology of stasis alone is not understood ; it is, however, often associated with infection.

In animals gall stones are most frequently associated with distomatosis in cattle and sheep ; numerous small stones are found composed of end products of inflammation with carbonates and phosphates of calcium and magnesium. Inspissated deposits with a high specific gravity sometimes occur in pigs.

—A. T. PHILLIPSON.

SHANKS, P. L. (1938). **An Unusual Condition Affecting the Digestive Organs of the Pig.**—*Vet. Rec.* **50.** 356-358.

A description of an undiagnosed disease of pigs 10-14 weeks old seen on 20

farms in Northern Ireland. In all cases there was a history of sudden change of diet from poor to rich and resultant sudden death. A few pigs seen before death showed excitement, incoordination of the limbs and acute conjunctivitis with oedema of the eyelids. The eye changes were a notable P.M. feature and there was also oedematous thickening of the stomach wall or oedema of the mesentery. The gastric oedema was confined to the space between the mucous and muscular coats and in a few cases the lesions extended to the small intestine.

The disease could be prevented by stopping the rich food and giving a saline purge and bran mashes.—J. E.

HINDMARSH, W. L. (1937). **Trembling in Young Pigs.**—*Aust. vet. J.* **13.** 249-251. [6 refs.]

Several cases are recorded in which violent tremors of the head, trunk and limbs were noted in new-born pigs when disturbed. Among those that recovered the symptoms usually disappeared in fourteen days. The condition appears to be similar to that reported by other observers [*V. B.* **7.** 546.], but evidence of an hereditary factor in the present cases was not strong.—H. B. CARTER.

KERNKAMP, H. C. H., & BOYD, W. L. (1938). **Erythema Multiforme: A Disease of the Skin in Swine.**—*J. Amer. vet. med. Ass.* **93.** 392-393. 1 fig. [2 refs.]

Seven members of a litter of swine were affected with a skin condition, the macroscopical and histological appearance of which is described. The cause was not established but there was a history of dipping in a coal tar dip seven days previous to the onset of the condition, at which time the skin of all the pigs was normal.—L. E. HUGHES.

WITZIGMANN, J. (1939). Das Ekzem im Lichte neuer Forschung. [**Eczema in the Light of Recent Research**].—*Dtsch. tierärztl. Wschr.* **47.** 1-3.

Speculation concerning aetiology. Such factors as warm weather, intestinal intoxication, allergy, acidosis, avitaminosis, hormonal dysfunction and hypothyroidism are discussed. Special attention is given to the operation of vitamin H, on account of its relation to fat metabolism, keratinization of the skin and seborrhoea.
—V. CHLÁDEK (PRAGUE).

WILLIAMS, J. G., STEYN, D. G., & GROENEWALD, J. W. (1938). **An Investigation into the Nature and Cause of a Disease in New-Born Merino Lambs Affecting the Thyroids and Nervous Systems.**—*J. S. Afr. vet. med. Ass.* **9.** 182-187. [1 ref.]

A disease of new-born lambs is described in which the most prominent symptoms were enlargement of the thyroids and peculiar forms of ataxia. In some cases almost all the lambs were affected. The thyroids were enlarged in nearly all cases, being 10 times their normal size. The mortality was almost 100% and death occurred sometimes within a few hours of birth, sometimes a few days later. The disease was apparently caused by a deficiency in the ewes, which had grazed on very poor, dry, mature grass pastures. There seemed to be a prolonged deficiency of several food substances such as vitamin A, phosphorus and iodine. As preventive measures the authors suggested avoidance of overstocking and giving the ewes green food for one or two months before lambing.—E. M. ROBINSON.

HINDMARSH, W. L. (1937). **Congenital Deformity in Calves.**—*Vet. Res. Rep., Dep. Agric. N.S.W. 1937.* pp. 58-63. 1 table.

The condition described occurs only among cattle pastured in swamp areas

in the Maitland (N.S.W.) district; it is of frequent occurrence among such cattle. The incidence of the birth of deformed calves appeared to bear some relation to the depth and permanence of the swamps and the amount of time spent by cattle in the swamp. The swamp herbage comprises *Triglochin procera*, *Paspalum distichum* and *Jussieua repens*. Feeding trials with these plants on g. pigs suggested that *Jussieua repens* might be responsible for the condition.—H. McL. Gordon.

Hewetson, H. R. (1936). **Hysteria in Dogs.**—*Vet. Rec.* **48.** 1202-1210. Discussion pp. 1210-1218. 1 table. [Numerous refs.]

In the light of his own clinical experience, H. reviews the various theories advanced with regard to the aetiology of canine hysteria. He does not arrive at any definite conclusion but tends to suggest that a number of factors—diet, environment, etc.—may act simultaneously. Blood samples taken from dogs suffering from hysteria were submitted to chemical analysis for Ca, Mg, and blood sugar; they gave values which fell within the normal ranges. The author discusses prophylaxis, prognosis and treatment. A number of speakers took part in the subsequent discussion on this paper, the general concensus of opinion appearing to be that hysteria had a dietetic origin.—N. J. Scorgie.

Verstraete, A., & Thoonen, J. (1938). Hypophysaire cachexie bij den hond. [**Pituitary Cachexia in a Dog**].—*Vlaam. Diergeneesk. Tijdschr.* **7.** 186-196. 5 figs. on 2 plates. [6 refs.] [English, French and German summaries].

A case of pituitary cachexia in a dog is described, corresponding clinically to Simmonds' disease in man, with extreme emaciation, pyrexia, atrophy of the genital organs and alopecia.

Histological examination revealed general atrophy of the thyroid and adrenal glands and genital organs.—Jac. Jansen (Utrecht).

I. Frederiksen, O., & Englebreth-Holm, J. (1938). **The Reactivation of the Fowl-Leukosis Agent after Inactivation by Oxydization.**—*Acta path. microbiol. scand.* Suppl. No. 38. pp. 49-51. [In English].

II. Lee, C. D., & Wilcke, H. L. (1939). **The Migration of the Etiologic Agent of Fowl Leukosis when Subjected to Electrophoresis.**—*J. Amer. vet. med. Ass.* **94.** 178-186. 6 tables. [9 refs.]

I. This is a summary of material presented at the Scandinavian Pathological Congress in 1938. The authors state that infective plasma can be rendered inactive by subjecting it to oxidation and can be reactivated by subjecting it to reduction. They state that their findings may be of importance in relation to the question as to whether tumour viruses are to be considered as living micro-organisms or as chemical substances.

II. Material prepared from tumour-bearing organs of an affected bird was subjected to electrophoresis at pH values ranging from 4·01 to 9·01, and injected into healthy birds in a series of six experiments. The work shows that at pH values 4·01 to 6·01 the aetiological agent migrates to the negative pole, while at pH values of 7·01 to 9·01 it migrates to the positive pole; beyond the limits of pH 4·01 and 9·01 it is inactivated.—W. J. Ironside.

Jansen, J. (1938). Over het voorkomen van leucosis, tumoren, en darmparasieten op een kippenbedrijf vrij van Neurolymphomatosis gallinarum. [**Leucosis, Tumours, and Intestinal Parasites in Fowls Free from Fowl Paralysis**].—*Tijdschr. Diergeneesk.* **65.** 392-394. [English, French and German summaries].

A poultry farm of 2,000-3,000 birds was kept under supervision for 3½ years,

during which time no symptoms of neurolymphomatosis gallinarum were seen In 256 P.M. examinations no nerve changes were observed. On the other hand, the farm appeared to be strongly infested with all varieties of intestinal parasites, and leucosis and tumours were found in 8·2% of the birds.

BUTLER, W. J., WARREN, D. M., & HAMMERSLAND, H. L. (1938). **Nutrition as a Factor in the Incidence of Fowl Leukosis.**—*J. Amer. vet. med. Ass.* **93.** 307-315. 6 figs., 3 tables. [2 refs.]

During the course of their investigations the authors encountered fowl leucosis with enteritis, and suggest that there was some association between the feeding of certain commercial foodstuffs and the enteritis. They suggest that this association was related to the rancidity, which they were able to demonstrate in the marine oils which these foodstuffs contained; the rancidity of these oils interfered with the assimilation of vitamins present in the diet.

In a number of flocks of poultry under observation fresh cod-liver oil and wheat germ oil added to the diet improved egg production and lowered the mortality. The results obtained in certain selected flocks are described with tabulated figures for blood counts of individual birds. It is suggested that nephritis and gout may result from the use of excessive amounts of wheat germ oil and cod-liver oil. The authors believe that some of the infectious diseases can be prevented from becoming active in the animal body by corrective changes in the diet.—L. E. HUGHES.

DURANT, A. J., & MCDOUGLE, H. C. (1938). **Leucemia (Erythro-Leucosis) of Canaries.**—*Vet. Med.* **33.** 388-389 and 420. 3 figs.

A condition is reported in canaries in which both liver and spleen were enlarged. The erythrocyte count was below normal. Attempts to transmit the disease to healthy birds failed.—L. E. HUGHES.

RUDDUCK, H. B., & WILLIS, R. A. (1938). **Malignant Tumours in Dogs.**—*Amer. J. Cancer.* **33.** 205-217. 20 figs. [7 refs.]

Nine cases of neoplasia in dogs are described, including two of epithelioma of the tonsil with metastases in the regional lymph nodes and lungs. The author states that carcinoma in the tonsils appears not to have been described. [Nevertheless, among dogs on which autopsies are made in London, this site is one of those most commonly affected with squamous cell carcinoma]. In both cases, the large size of the secondary tumour in contrast with the relatively inconspicuous primary tonsillar growth was a striking feature; in human cases, this has often been responsible for a wrong diagnosis. The remaining cases comprised :– primary adenocarcinoma of the cardiac portion of the stomach with metastases in the mediastinal lymph nodes, primary tumours of the pancreas with secondary tumours in the peritoneum and lymph nodes, and primary tumours of the prostate with wide-spread metastases; primary sweat gland carcinomata of the skin [sweat glands, contrary to prevalent teaching, being present in the skin of the dog]; carcinoma of the mammary gland in a bitch; mixed thyroid tumour with pulmonary metastases, and spindle cell sarcoma (possible rhabdomyosarcoma) of the heart, with metastases in the lungs and diaphragm.—E. G. WHITE.

CREW, F. A. E. (1938). **The Sex Ratio of the Domestic Fowl and its Bearing upon the Sex-Linked Lethal Theory of the Differential Mortality.**—*Proc. roy. Soc. Edinb.* **58.** 73-79. 3 tables. [13 refs.]

The sex-linked lethal theory, implying the lesser viability of the heterogametic sex, has always assumed that in birds and moths, where the female is the heterogametic sex, the female would therefore prove less viable. Since the literature on

the sex ratio of the fowl includes many conflicting statements, C. undertook an investigation on the sex ratio in 8,565 dead-in-shell chicks, determining the sex by down colour and dissection, 515,976 live-born chicks whose sex was determined by sex-linked colouring (" gold " cock + " silver " hen give white male chicks and buff female chicks) and a further 2,216,051 chicks sexed by the Japanese method (size and pigmentation of the cloacal papilla—98% accuracy is claimed for this method). Tables are given showing the results; there was a slight preponderance of males, so that these results offer no support for the sex-linked lethal theory.

C. points out that in his investigations he found that the sex ratio seemed to vary according to breed, and he asserts that this must account for the different results obtained by various workers using different breeds.

NUTRITION IN RELATION TO DISEASE

GRUND, R. (1937). Beiträge zur Histologie der endokrinen Drüsen von leksuchtkranken Rindern. [**Histology of the Endocrine Glands in Bovines Affected with Pica**].—*Inaug. Diss., Hanover.* pp. 37. 1 table.

The endocrine glands of eight young cattle affected in varying degrees with pica were examined. The chief abnormality was found in the thymus glands in that they had either quite disappeared or only small vestiges were discovered in animals in which normally the glands would have been developed to their fullest. The microscopic structure of the remnants is described. The parenchyma had not been replaced by fat cells. The pituitary body in each case was subnormal in volume and weight; the structural alterations in this and in the other glands are discussed. An account is given of the apparent regeneration of the glands of one animal which after showing advanced signs of pica was given an adequate diet and was slaughtered when apparently in a normal healthy condition.
—G. WILLIAMSON.

ROSSI, P. (1938). L'azotémie en médicine vétérinaire. [**Azotaemia in Veterinary Medicine**].—*Rev. vét. milit.* **22.** 201-217. [Numerous refs.]

Azotaemia is defined as retention of the metabolic nitrogen waste-products in the body. It is characterized by an increase in the amount of blood urea, the normal levels for horses being given as 0·30-0·35 g. per litre of blood and for cattle as 0·30-0·40 g. These amounts are exceeded as a result of kidney impairment, *e.g.* nephritis, and also in certain bacterial and parasitic diseases. This article deals with the relation of parasitic diseases to azotaemia. R. found that the urea level of the blood was raised in equine piroplasmosis, mange, and infectious anaemia, but not in strangles, tetanus, or equine *Brucella abortus* infection. In Aujeszky's disease of cattle and in " influenza du boeuf " (stated to be due either to a *Pasteurella* or to a virus), the blood urea was markedly raised. There was also a transitory rise after surgical operations and after parturition. A simple method for the estimation of blood urea is described.—N. J. SCORGIE.

HENRY, Kathleen M., & KON, S. K. (1939). **Studies on the Metabolism of Calcium and Phosphorus and on the Availability of these Elements from Milk and from an Inorganic Source.**—*Biochem. J.* **33.** 173-191. 15 tables. [Numerous refs.]

In a series of metabolism experiments with young male rats, the Ca of milk was found to be more available than that of $CaHPO_4.2H_2O$. In the presence of

extra P (as $Na_2HPO_4.12H_2O$) Ca was retained more efficiently from spray-dried milk than from $CaHPO_42H_2O$ and under such conditions one-third the daily loss of Ca in the excreta of the rat is in the faeces and two-thirds in the urine. Retention of P is by no means as efficient as Ca even in the presence of extra Ca (as $CaCO_3$ and 90% of the minimal loss of P occurs through the faeces. It is suggested that this relatively inefficient retention of P is due to the fixation of some of this element by intestinal bacteria, and that the faecal loss is mainly bacterial P. There is no evidence (at least in the rat) that the large intestine actively excretes either Ca or P, thus contradicting the usually accepted teaching.—ALFRED EDEN.

HINDMARSH, W. L., & BLUMER, C. C. (1937). **Studies in Nutrition of Sheep in the New England District of New South Wales. I. Nutritional Anaemia of Sheep. (Poorness of Blood of Sheep).**—*Vet. Res. Rep., Dep. Agric. N.S.W. 1937.* pp. 15-37. 8 tables. [3 refs.]

GRIFFITHS, E. L., & BENJAMIN, M. S. (1937). **Studies in Nutrition of Sheep in the New England District of New South Wales. II. Soil and Pasture Analyses of Affected Properties.**—*Ibid.* pp. 38-40. 3 tables

I. The symptoms shown by affected sheep included gradual loss of condition commencing from early autumn, lachrymation, pining, anaemia, weakness, and death. Sheep moved to other districts soon regained health and condition. Preliminary investigations suggested that the following factors were concerned in the causation of the losses :– the pastures were poor, rabbit infestation was heavy, the country was overstocked, worm infestation was common, and the winter climate was severe. A field trial demonstrated that neither the administration of iron in lick form nor anthelmintic treatment with copper sulphate led to alleviation of symptoms. A second trial established the following facts :–

(1) Di-calcic phosphate taken at the rate of 7-49 g. per sheep per week had little effect on the condition.

(2) Meat meal (protein 60·4%, tricalcic phosphate 9·5%, moisture 4·8%) was not eaten in sufficient amounts to be of value in maintaining the condition of sheep. This was considered to be partly due to the fact that it was incorporated in a mixture of dicalcic phosphate and salt, that meat meal is not palatable to sheep, and that under conditions that exist in the tableland areas, meat meal, although in covered troughs, absorbs much moisture and tends to undergo decomposition in wet seasons.

(3) Drenching sheep at monthly, and later, fortnightly intervals with copper sulphate solution had little effect in reducing the incidence of anaemia.

(4) The provision of a more nutritive diet in the form of cultivated and sown pasture, or of oats and lucerne hay, enabled sheep to recover from anaemia and gain in body weight.

II. Four soil and two pasture analyses were carried out. The soils examined were light sand loams of granitic origin. They were strongly acidic and contained low percentages of " citrate soluble " phosphoric acid (0·0005-0·0017%) and lime (0·049-0·09%). Soils were also deficient in nitrogen and organic matter. Pasture samples showed low percentages of phosphoric acid (0·194-0·261% of dry matter) and crude protein (5·77-7·18%). There was a suggestion that other elements, *e.g.* iron, might be deficient in the pasture.—H. McL. GORDON.

GENDREAU, L. A. (1938). **Anaemia in Suckling Pigs.**—*Canad. J. comp. Med.* **2.** 105-107.

A reference to the value of sunlight, sods and green food for the prevention of the disease ; the feeding of iron to sows in the absence of these conditions is

ineffectual, and to save affected sucklings, it is necessary to administer iron (ferrum redactum) in 15 grain doses every other day from birth until the animals can eat.
—L. M. HEATH.

I. HUTCHINSON, J. H. (1938). **The Role of Copper in Iron Deficiency Anaemia in Infancy.**—*Quart. J. Med.* **7.** 397-419. 9 tables, 9 charts. [Num. refs.]
II. ANON. (1939). **Trace Elements in Anaemia.**—*Brit. med. J.* March 11th. 513-515. [4 refs.]

I. After fully reviewing the available literature on the role of Cu in the Fe-deficiency anaemias, H. describes the results obtained with nine infants suffering from a nutritional anaemia, following both Fe and Cu therapy. Metabolism studies were conducted at the same time and it was found that administration of Cu following Fe therapy increases the conversion of Fe stored in the tissues into haemoglobin as reflected by R.B.C. counts and Hb determinations. Further, it was shown that Fe given in small doses so as not to raise materially the Hb content of the blood can be subsequently mobilized by giving Cu and be converted into Hb. It is suggested that the action of Cu is catalytic, enabling the Fe stored in the tissues to be converted into such a form that it is transported by the blood plasma to the bone marrow, where it can be utilized for Hb formation.

II. This article deals principally with the relationship of Cu to anaemia although the Australasian work on Co in anaemias of sheep is briefly reviewed. The importance of Cu is further emphasized by :– (a) Japanese work in which the effect of additional Cu in blood transfusion in women after childbirth or in chronic anaemia was found greatly to accelerate the regeneration of R.B.C. and Hb, and (b) the work of HUTCHINSON [see abstract above] who found that in infants fed exclusively on a milk diet, when Hb regeneration ceased or declined after the cessation of Fe therapy, it could be regained by the administration of Cu alone (as had been previously shown with rats). The catalytic action of Cu appears to enable Fe from the storage depots of the body to be converted into a transportable form and to be utilized by the bone-marrow for Hb formation.—ALFRED EDEN.

I. VEDDER, E. B., & CHINN, A. B. (1938). **Beriberi or Inanition? I. The Effect of Starvation, with and without Vitamin B_1.**—*Amer. J. trop. med.* **18.** 469-475. 3 figs., 2 tables. [4 refs.]
II. VEDDER, E. B. (1938). **Beriberi or Inanition? II. The Administration of Vitamin B_1 to Rats Receiving Unbalanced Diets.**—*Ibid.* 477-481. 1 table. [5 refs.]

I. Three groups each of six rats were subjected to the following treatments respectively :– (1) complete starvation, (2) starvation plus a daily dose of 3,000 γ of vitamin B_1 in crystalline form, and (3) an ordinary diet deficient in vitamin B_1. Examination of the sciatic and brachial nerves treated by the Marchi method showed no difference between the degree of degeneration present in the animals of all three groups. The fact that even such a large dose of vitamin B_1 did not prevent degeneration of the nerves in group (2) is taken to indicate that the rat cannot use vitamin B_1 directly in the absence of food. The decrease in weight of the hearts of animals deprived of vitamin B_1 was proportionally greater than the loss of body-weight.

II. P.M. examinations of three groups of rats fed on protein, fat and carbohydrate diets respectively plus 200γ of crystalline vitamin B_1 per rat daily, revealed no degeneration of the peripheral nerves in the protein and fat groups, but the rats fed on carbohydrate did develop a slight degeneration of the nerves in spite of the vitamin B_1 supplement. Since the group on a fat diet lost an average of 28% of

their original body-weight and all subcutaneous and body fat, it was considered that they definitely suffered from inanition, yet no nerve degeneration occurred. Therefore it is considered that the degeneration of the nerves found in polyneuritis cannot be ascribed to inanition. V. considers that these facts throw a grave doubt on the theory that the nerve degeneration of polyneuritis is due to pyruvic acid.
—R. ALLCROFT.

BIRD, H. R., OLESON, J. J., ELVEHJEM, C. A., & HART, E. B. (1938). **Effectiveness of Chondroitin in Preventing Gizzard Erosion in Chicks.**—*J. biol. Chem.* **126.** 671-678. 2 tables. [17 refs.]

Chondroitin preparations fed to chicks until they were four weeks old were effective in preventing gizzard erosion. The chondrosamine portion of the chondroitin molecule was not effective, but evidence that glucuronic acid is the active portion is presented and discussed.—R. ALLCROFT.

WALLIS, G. C. (1938). **Some Effects of a Vitamin D Deficiency on Mature Dairy Cows.**—*J. Dairy Sci.* **21.** 315-333. 4 figs., 1 table, 3 charts. [18 refs.]

The experiments reported in this paper verified that milking cows require vitamin D even though the Ca : P ratio of the diet be correct. Three cows in milk and one dry cow were kept on rations considered adequate except for the absence of vitamin D. Under these conditions the total Ca and P of the blood plasma showed a marked decline after three to four months, and shortly afterwards the cows showed signs of stiffness, which gradually increased in severity, the knees became bent forward, the spine rigid, and ultimately the animals were unable to rise without assistance. Administration of vitamin D immediately relieved these symptoms, and in the latter part of the lactations quickly changed a negative Ca and P balance to a positive one. One animal died and it was found that both femurs and the pelvis were fractured. Calves born after the cows had been on the deficient diets for some time had a rachitic appearance.—N. J. SCORGIE.

BRANION, H. D., TISDALL, F. F., & DRAKE, T. G. H. (1938). **Beryllium Rickets in Chickens.**—*Poult. Sci.* **18.** 66-69. 4 plates, 1 table. [8 refs.]

Four groups of chicks were fed from hatching until 10 weeks of age upon normal rations, 3 groups receiving in addition 0·5%, 1·0% and 2·0% beryllium carbonate respectively. In the group receiving 1% there was a slight retardation of growth, more definite in the 2% group. By means of X-ray plates, plasma inorganic P and bone ash determinations it was found that at the 0·5% $BeCO_3$ level there was no significant change in the plasma P level or on bone formation. Some rickets occurred in the 1% $BeCO_3$ group, which was further characterized by a decided lowering of the plasma P and of the percentage of bone ash, with, however, marked individual variations. In the 2% group these changes were much more evident and rickets occurred in all chicks. From these results it is concluded that chicks are more resistant to Be rickets than rats, although there is a distinct individual variation.—ALFRED EDEN.

MARKUZE, Zofia. (1939). **Vitamins of Elephant's Milk.**—*Biochem. J.* **33.** 198-200. 3 tables. [8 refs.]

The vitamin content of the milk of an elephant, in Warsaw, fed on grass, hay, wheat-bran, oil-cake, carrots and beets was compared with that of cows fed on a very similar diet. The quantity of vitamin A and D in the elephant's milk was much less than that in the cows (under 1 I.U. per ml.) but the vitamin B_1 content was higher, being 25 I.U. per 100 ml. The elephant's and the cow's milk contained

practically the same amount of B_2 complex but the former had 7·72 mg. per 100 ml. of ascorbic acid compared with 2·12 mg. in the latter. The assays for the various vitamins were not made simultaneously nor throughout the whole period of lactation.—G. WILLIAMSON.

PUBLIC HEALTH

DEFRIES, R. D. (1938). **Survey of Certain Milk-Borne Diseases in Canada.**—*Canad. publ. Hlth J.* **29.** 255-261. 1 table. [13 refs.]

In this paper D. supplements the information compiled by MURRAY [*V. B.* **7.** 490.] in 1936 with data obtained from the provincial departments of health and a number of municipalities. Evidence of the extent to which tuberculosis of bovine origin may be due to milk is furnished by the fact that 9·6% of the cases of extra-pulmonary tuberculosis in children under 14 years was due to the bovine type of bacilli; all these patients used raw milk. Typhoid and paratyphoid fevers have been the most frequently reported milk-borne diseases in Canada, and reference is made to certain outbreaks. Septic sore throat due to streptococci transmitted in milk has been encountered, and various cases of staphylococcal food poisoning have been traced to the milk supply. In recent years, many cases of undulant fever in Canada have also been shown to be caused by the consumption of infected milk.—J. L. BYRNE.

CLARKE, E. H. (1938). **The Producer and Safe Milk.**—*Canad. publ. Hlth J.* **29.** 298-300.

Clarke discusses the responsibility which rests upon the producer supplying milk for fluid consumption. The need for healthy stock, proper sanitation in utensils and surroundings, and the provision of an even supply and regular daily delivery to urban centres are mentioned. A set of instructions to the dairy farmer to enable him to reduce the number of bacteria is also given.—J. L. BYRNE.

WOOD, S. N. (1938). **Brucellosis of Dairy Cows [Danger to Man]. A Public Health Problem.**—*Canad. J. comp. Med.* **2.** 241-252. 4 charts. [Num. refs.]

The article reviews the recent literature and gives in four instructive charts the possible sources of infection, the routes by which the bacillus gains entrance to the human organism, and the incidence of the disease in human beings. While raw milk is generally considered as one of the most important sources of infection, recent literature indicates the higher virulence of *Brucella suis* to man and the danger of the pig and its products as a reservoir of infection. The importance of direct contact with infected farm animals and the handling of raw meat from such animals in the transmission of the disease is pointed out. Ways and means are then discussed by which the supply of wholesome milk may be assured.—H. KONST.

I. ELLINGER, C. (1938). **Controlling Contamination of Raw Milk.**—*Canad. publ. Hlth J.* **29.** 277-282. 4 tables. [4 refs.]
II. BERRY, A. E. (1938). **Milk Control Legislation in Canada.**—*Ibid.* 301-304.
III. BERRY, A. E. (1938). **A Survey of Milk Control in Cities and Towns in Canada.**—*Ibid.* 305-309. 1 table.

I. E. reviews the efforts made over a period of seventeen years to improve the raw milk supply to the city of Edmonton. It is felt that the methylene blue reduction test permits the attainment of higher standards than does the plate count, because it measures utensil contamination more effectively, and that adoption

of the principles of the Standard Milk Ordnance (United States Public Health Service) is probably the best way to obtain desirable results quickly. The outcome of these efforts has been a marked improvement in the class of milk submitted for consumption.

II. Legislation for the control of fluid milk supplies is both a municipal and provincial responsibility. Local by-laws dealing with licensing and a variety of other details are passed in municipalities, under authority given by provincial statutes. A short synopsis is given of the regulations regarding milk supplies in the various provinces. B. points out that although provincial legislation varies considerably there is a movement to establish definite standards and more direct control over distributing plants. Ontario was the first province to adopt a compulsory pasteurization law. Dominion legislation has little to do with fluid milk, but through the Food and Drugs Act it controls milk products and their labelling, adulteration and composition.

III. In this paper, B. presents a complete table with data concerning the extent of pasteurization, volume of milk distributed and supervision of herds in municipalities having a population of more than 2,000. The information was obtained from the medical officers of health in the various centres. There is complete pasteurization of milk in two cities in Saskatchewan, in thirty-two in Ontario and in four in Quebec. Practically all centres have pasteurization in part, a few have no pasteurization and from some no information on this point was given. Other information regarding the occurrence of typhoid fever and other communicable diseases was also obtained.—J. L. Byrne.

Burn, G. A. H. (1938). **Cleansing and Disinfecting Operations in a Small Dairy.** —*Canad. publ. Hlth J.* **29.** 310-313.

The meaning of " cleansing " and " disinfection " is stressed. Plant and equipment design are referred to, also washing powders, disinfecting agents, cleansing and sterilizing equipment, bottle washing and disinfecting, and the washing and sterilizing of cans. A procedure for determining efficiency of washing and disinfecting operations is suggested, and provisions for cleanliness of personnel are outlined. Methods of following the regulations passed under authority of the Milk Control Act of Ontario are discussed.—C. Mackie.

Smith, M. Doreen. (1938). **The Use of the Phosphatase Test in the Control of Pasteurization.**—*Canad. publ. Hlth J.* **29.** 288-294. [17 refs.]

This test is highly sensitive. The degree of accuracy and the adaptability of the test to various temperatures of pasteurization according to the graph of Kay and Graham [*V. B.* **6.** 542.], are discussed, as well as various later modifications.

Practical experiences with the test are reviewed, its use in the examination of other dairy products mentioned and finally possible sources of error and certain limitations are pointed out.—H. Konst.

Guittonneau, G., Mocquot, G., & Eyrand, A. (1938). Recherches sur la pasteurisation des laits de consommation. 1er mémoire : Choix d'un milieu de culture pour la numération des germes microbiens. [**Pasteurization of Milk. 1. Choice of a Medium for Bacterial Counts**].—*Lait.* **18.** 225-233. 5 tables. [4 refs.]

The considerations which lead to the choice of medium for direct plate-count of bacteria in raw and pasteurized milk are discussed. The authors chose a medium of which the base was skim milk, to which trypsine was added. The final product possesses all the nutritive elements of skim milk except casein, which is replaced

by products of trypsin-digestion. It is not stated how the casein was removed. Untreated skim milk proved too opaque for use, but the opacity was satisfactorily reduced by the addition of the trypsin. The suggested medium proved inexpensive and easy to procure and to prepare in laboratories situated near milk factories.

The authors compared the results of examination of raw and pasteurized milk on this medium and on the media of Bower and Hucker and of Demeter. No appreciable difference was noted in the results obtained from the use of each of the three media so compared.—H. Burrow.

Joss, E. C. (1939). **Construction and Equipment of Municipal Meat Plants.**—*J. Amer. vet. med. Ass.* **94.** 172-177.

The author states that 800 veterinarians are engaged on meat inspection and inspect about two-thirds of the animals used for human food in the U.S.A. The other third receives only limited veterinary inspection.

He recommends that the slaughterhouse should be situated where there is an ample and hygienic water supply, and adequate drainage for removal of the sewage from the slaughterhouse. The slaughterhouse should not be located in an area of factories and industries which give off dust and gases.

In a modern slaughterhouse concrete is preferable to wood. In the lairs and workrooms the window space should be equal to 25% of the floor space, and the water supply used for cleaning down workrooms should be under pressure and used through hose pipes. All the buildings should be adequately ventilated. There should be bleeding rails for cattle 16 feet above the floor and for sheep 11 feet above the floor. All openings should be screened to prevent the entrance of flies. Modern dressing rooms and lavatories should be provided for all the workers; drainage from the latter should not be connected to the drainage from the slaughterhouse.

Where metal equipment is required, joints should be eliminated as far as possible and the metal should be of rust-resistant material.

Mechanically-operated equipment is desirable for the cleaning of cattle viscera, and mechanical tripe-cleaning equipment of the sanitary type is also procurable. With these appliances the chance of soiling the organs and fats and other edible parts is reduced.

In this work the veterinarian has a community responsibility.

—Brennan DeVine.

Tobey, J. A. (1939). **Some Legal Aspects of Food Sanitation.**—*J. Amer. vet. med. Ass.* **94.** 153-156. [3 refs.]

Food sanitation is an important function of public health administration and it is the duty of the state to carry this out. Meat and dairy products are a common cause of food infections and this justifies adequate food control.

In the United States new federal laws have been introduced in the form of the new Food, Drug and Cosmetic Act. The provisions of this Act, from the food control point of view, are a great advance on preceding legislation; the Act prevents the false advertising of foods.

In addition to the federal laws there are the laws of the local authorities, particularly the municipalities, dealing with food control. These latter laws permit the local authorities to issue licences and permits in connexion with the manufacture of food. These laws should not, in themselves, remove the responsibility from the trade concerned, as it is the duty of the trade to deal with its products under hygienic conditions. Indeed, if the particular trade concerned carried out its responsibilities in a proper manner, there would be no need for the municipalities

to make byelaws in connection with meat control. In most centres the dairy industry and the meat industry have successfully modernized their plants with a view to producing food under hygienic conditions.—BRENNAN DEVINE.

THERAPEUTICS

MERILLAT, L. A. (1938). **Chemotherapy.**—*Canad. J. comp. Med.* **2.** 63-71.

In accordance with the idea that physiologists and chemists by their researches are the path finders in clinical medicine, M. suggests the name " physio-chemistry " as a substitute for chemotherapy. He also points out that the study of the use of drugs and chemicals as remedies has been neglected owing to the efforts directed towards the production of biological specifics. In presenting his subject he makes brief mention of avitaminoses, ultraviruses, skeletal demineralization, therapy of digestive disorders and the use of iodine, sulphanilamide, pyferol (a tumour solvent) and glucose.—L. M. HEATH.

GREEY, P. H. (1938). **Experimental Studies with Sulphanilamide and Other Compounds.**—*Canad. med. Ass. J.* **39.** 12-15. [1 ref.]

The author briefly reviews the experiments leading up to the intensive investigations with sulphanilamide.

I. HAMANN, E. E., & HUDDLESON, I. F. (1939). **Effect of Prontosil and Sulfanilamide on Brucella Abortus Infection in Two Cows.**—*J. Amer. vet. med. Ass.* **94.** 35-37. 2 tables. [3 refs.]

II. CHINN, B. D. (1939). **The Use of Sulfanilamide in Experimental Brucellosis.**—*J. infect. Dis.* **64.** 78-82. 2 tables. [Numerous refs.]

III. WILSON, G. S., & MAIER, Irene. (1939). **The Sulphanilamide Treatment of Guinea-Pigs Infected with Brucella abortus.**—*Brit. med. J.* Jan. 7th. 8-9. 2 tables. [3 refs.]

I. One of the animals was given prontosil in 5% solution subcutaneously and intramuscularly over a period of seven weeks and sulphanilamide twice daily *per os* for a week in the middle of the period of treatment. In the other, prontosil solution was injected into one of the quarters of the udder, six such injections being made over a period of five weeks. It was observed in both animals that a rise of temperature followed the administration of the drug, but in so far as the effects upon the agglutination titre and the excretion of brucella in the milk were concerned the results were inconclusive.

II. This deals with the effect of sulphanilamide on *Brucella melitensis*, *Br. abortus* and *Br. suis*. *In vitro* experiments showed that a concentration of 1:1,000 in dextrose broth destroyed *Br.a.* and *Br.s.* in ten minutes ; a small number of *Br.m.* survived this exposure, but were destroyed within 24 hours. Lower concentrations were also used and were shown to have some bactericidal and bacteriostatic effect. *In vivo* experiments on g. pigs showed that the administration of the drug had a curative effect in a considerable number of cases and that this effect was better on *Br.a.* and *Br.s.* than on *Br.m.*

III. Two experiments were carried out in which groups of small numbers of infected g. pigs were treated with doses of various sizes and over various periods of time. Bacteriological examination of sublumbar lymph nodes and spleens revealed brucella infection in all groups except in those to which large doses had been given over a long period. In all groups however the number of organisms found present was smaller than in the controls. The authors tentatively conclude

that treatment favours the destruction of infection in g. pigs but that to attain bacteriological cure the drug must be given daily for some weeks in a dose bordering on the toxic limit.—W. J. Ironside.

Plummer, P. J. G., Mitchell, C. A., & Walker, R. V. L. (1938). **Experiments with Sodium Sulfanilyl Sulfanilate.**—*Canad. J. comp. Med.* **2.** 139-141. 2 tables, 1 graph. [1 ref.]

The authors were unable to confirm the work of Dochez and Slanetz [*V. B.* **8.** 603.], who claimed that they were able to cure ferrets and dogs of dog distemper with sodium sulphanilyl sulphanilate. Nor did they find that the drug had any therapeutic action against the virus of equine encephalomyelitis (western type). —L. M. Heath.

Henry, A., & Guilhon, J. (1939). Essais de traitement de la staphylococcie cutanée du chien par un dérivé sulphamidé ; α (p. amino-benzène sulfamido) pyridine. **[Treatment of Cutaneous Staphylococcus Infection in the Dog with M & B 693 and a Variant].**—*Bull. Acad. vét. Fr.* **12.** 92-95.

A record was made of the results obtained by the use of a member of the sulphonamide group, M & B 693, in three cases of staphylococcal skin infection in dogs. Dosage was *per os*, and in addition, a sodium variant of M & B 693 was given intravenously. The symptoms described corresponded to those of follicular mange. No toxic symptoms referable to the M & B 693 were recorded although dosage was considerable. The lesions healed and hair was replaced.—R. I.

Gwatkin, R., & MacLeod, A. H. (1938). **Wheat Germ Oil in Brucella Infection in Cattle and Guinea-Pigs.**—*Canad. J. comp. Med.* **2.** 133-136. [2 refs.]

Twenty-four cows from a reacting herd were divided into two groups, as equal as possible as regards serological reactions, previous abortions and ages. Each animal of one group received three subcutaneous inoculations in 33 c.c. of wheat germ oil, the other group being used as a control. The first inoculations were made a few days before or after breeding, and the other two, at three and at six months thereafter, respectively. Both groups intermingled freely. The results did not support the claims of Moussu [*V. B.* **6.** 732].

Seven fortnightly inoculations of 1 c.c. subcutaneously of wheat germ oil into g. pigs had no effect on the course of the disease when these animals were experimentally infected *via* the eye.—L. M. Heath.

Faure, L. (1939). Traitement des teignes du cheval par la chaleur. **[Heat Treatment of Equine Ringworm].**—*Ann. Parasit. hum. comp.* **17.** 108-110. 1 fig. [1 ref.]

The author describes a method of treating ringworm in the horse by the application of a blunt-ended firing-iron heated to a dull red. He states that the skin and hair follicles are not injured as the iron is applied so lightly as to sear only the infected hairs and the superficial layer of the skin. Advantages claimed are, rapid cure of the affected animals, and ensured prevention of the spread of infection. —R. Isherwood.

Smith, W. A. (1938). **Treatment of Sterility in Mares by Insufflation of the Fallopian Tubes.**—*Vet. Rec.* **50.** 1192-1193. 1 fig.

S. describes a modification of human gynaecological technique for use in the mare. Four mares which had failed to breed for two or three seasons were treated and thereafter produced foals.—J. G. Murray.

PERVAKOV, A. J. (1937). K terapii diktiokauleza ovec. [**The Treatment of Dictyocaulosis of Sheep**].—*Papers on Helminthology, Commemorating 30 Year Jubilee of Prof. K. I. Skrjabin.* pp. 467-468. Moscow: Lenin Acad. Agric. Sci.

P. made comparisons between a watery solution of iodine with and without glycerin; both solutions had similar anthelmintic properties.

I. BISHOP, P. M. F., BOYCOTT, Muriel, & ZUCKERMAN, S. (1939). **The Oestrogenic Properties of "Stilboestrol" (Diethyl-Stilboestrol). A Clinical and Experimental Investigation.**—*Lancet.* **236.** 5-11. 9 figs., 3 tables. [9 refs.]

II. WINTERTON, W. R., & MACGREGOR, T. N. (1939). **Clinical Observations with Stilboestrol (Diethyl-Stilboestrol).**—*Brit. med. J.* Jan. 7th. 10-12. [5 refs.]

III. LOESER, A. A. (1939). **Therapeutic Trials of Diethylstilboestrol.**—*Ibid.* 13. [5 refs.]

I. The authors have investigated carefully the oestrogenic properties of the synthetic hormone stilboestrol. It appears to imitate closely the natural oestrogens. Oral administration is as effective as administration by intramuscular injection.

II. The effective use of stilboestrol in the treatment of a number of cases of endocrine disturbance in the human subject is reported. The effects produced appear to be identical with those resulting from the administration of natural oestrogens. Administered prior to the appearance of milk in the mammary gland it effectively prevents the onset of lactation. If administered after lactation has begun, milk flow is diminished but not arrested.

III. From the clinical evidence presented it is clear that stilboestrol has marked oestrogenic effects and that it has a good "substitute action" in various forms of ovarian insufficiency.—R. N. C. AITKEN.

POISONS AND POISONING

HADLEY, F. B. (1938). **The Sudan Grass Poisoning Problem.**—*Canad. J. comp. Med.* **2.** 169-170.

This short paper is a summary of an investigation into the poisonous properties of Sudan grass (*Sorghum vulgare sudanese*), and of the cyanogenetic glucoside it may contain. The relative concentration in the grass varies with its colour and length and with the type of soil on which it is grown. It was further observed that cattle ceased to eat grass with a high cyanogenetic glucoside content after fifteen minutes. Practical application of the information given should materially reduce losses.—L. M. HEATH.

THORP, F., Jr., & HARSHFIELD, G. S. (1939). **Onion Poisoning in Horses.**—*J. Amer. vet. med. Ass.* **94.** 52-53. [6 refs.]

Onion poisoning occurred in nine horses which had had access to a field of unharvested onions during winter. Seven died with icterus and anaemia, the urine being coffee-coloured. Similar results have been observed by other workers in cattle and in dogs. The eating of onions that have decayed after exposure to freezing and thawing appears to be especially dangerous.—J. A. GRIFFITHS.

BINNS, H. R. (1938). **Cottonseed Poisoning of Pigs.**—*J. comp. Path.* **51.** 296-304. [15 refs.]

A ration containing 25% cottonseed, which was fed to pigs for two weeks,

caused fatal poisoning during the 5th week after the diet was begun in 14 out of 23 pigs aged 4 to 6 months. Of 8 adult pigs one vomited and 2 had anorexia, vomiting and diarrhoea. Symptoms and lesions observed are described. It is is concluded that cases of poisoning essentially similar to those caused by cottonseed cakes and meal are produced by unaltered cottonseed, and that the toxic agent is therefore present in the raw seed. The ration fed to the affected herd was deficient in protein and minerals. It is suggested that the very severe effects, produced by the comparatively small amount of cottonseed in these experiments, support the view that there exists a relation between the susceptibility to cottonseed poisoning and nutritional deficiency, particularly a deficiency of protein, iron and calcium.
—J. A. Griffiths.

de Waal, H. L. (1938). **On the Constitution of the Bitter Principle "Geigerin" I. The Isolation of Various Degradation Acids.**—*Onderstepoort J. vet. Sci.* **10.** 395-410. 2 figs. [8 refs.]

The plant *Geigeria Aspera* Harv. (Compositae) contains two active substances, one a bitter principle called geigerin ($C_{15}H_{20}O_4$), and the other a substance called vermeeric acid ($C_{18}H_{28}O_7$), causing vomiting disease of sheep [see *V. B.* **9.** 343]. In this article the author records the results of experiments conducted on geigerin for the elucidation of its structure which may also lead to a solution of the structure of vermeeric acid since these two substances are closely related to each other.

Oxidation of geigerin by means of alkaline permanganate solution leads to the formation (1) of an acid $C_{10}H_{14}O_4$ and (2) of oxalic acid. The nitric acid oxidation of geigerin leads to an acid $C_{15}H_{18}O_6$ which again on oxidation with alkaline permanganate solution also yields oxalic acid. (Acetaldehyde is invariably an accompanying product in these oxidations). The $C_{15}H_{14}O_6$ acid is a monocarboxylic dilactonic acid, which can be saponified with alcoholic potassium hydroxide to a tricarboxylic acid and is again relactonized with HCl.

Based on the information so far obtained, the view is expressed that geigerin might belong to a sesquiterpene class of substances not hitherto observed in nature ; this hypothesis would explain the oxidation results by postulating a mechanism similar to that encountered in the camphor acids group.

Thorp, F., Jr., & Deem, A. W. (1939). **Suckleya Suckleyana, a Poisonous Plant.**—*J. Amer. vet. med. Ass.* **94.** 192-197. 3 figs., 3 tables. [2 refs.]

This plant, which occurs around water holes in Colorado, has been found by chemical analysis to be cyanogenetic. A sample used in experiments developed 0·0364% HCN and was toxic for cattle, sheep, rabbits and g. pigs. Symptoms of intoxication developed rapidly, and were followed by death or quick recovery according to the amount consumed.—J. A. Griffiths.

Fulstow, H. (1939). **Cryptogamic Poisoning in Horses.**—*Vet. Med.* **34.** 78-80. 2 figs.

A clinical description of " poisoning " by mouldy fodder. F. refers to " toxic encephalomyelitis " in horses [*V. B.* **7.** 262].—J. A. Griffiths.

Hindmarsh, W. L., & Hart, L. (1937). **Poisoning of Cattle by Ergotised Paspalum.**—*Vet. Res. Rep., Dep. Agric. N.S.W. 1937.* pp. 78-88.

Paspalum infested with ergot (*Claviceps paspali*) has been proved to be toxic to cattle, sheep and horses. The experiments indicated that the fungus is most toxic in the stage during which the ergots are being formed, the sphacelial stage

being innocuous and the fully formed sclerotia being less toxic than the immature stage. No immunity appears to follow recovery from poisoning.

The symptoms produced were hypersensitiveness, muscular tremors, incoordination of muscular control, increased glandular secretions, accelerated pulse rate, and in some cases digestive derangement. The chief lesion on autopsy was distension of the meninges with a clear serous fluid.—H. B. CARTER.

PHYSIOLOGY

I. WRIGHT, R. D. (1937). **The Blood Supply of Newly Developed Epithelial Tissue in the Liver.**—*J. Path. Bact.* **45.** 405-414. 8 figs. on 4 plates. [7 refs.]

II. WRIGHT, R. D. (1938). **The Blood Supply of Abnormal Tissues in the Lungs.**—*Ibid.* **47.** 489-499. 5 figs. on plate. [16 refs.]

III. ANON. (1938). **Blood Supply of Abnormal Tissues in the Lungs.**—*Lancet.* **235.** 1368-1369. [5 refs.]

I. There are two main types of epithelial tissue in the liver: the duct tissue and the parenchymatous tissue. The ducts are supplied by capillaries of the hepatic artery, the parenchyma by the portal vein and, possibly, by the hepatic artery *via* the capillaries of the portal vein.

20 human livers were injected with a coloured gelatin mass, blue into the artery, red into the vein. In 5 livers which showed areas of regenerated tissue, the new parenchyma received its afferent supply from the portal vein, whereas in 15 livers in which secondary carcinomata and growing bile ducts were present, the hepatic artery gave rise to the new vessels.

These experiments demonstrate that the blood supply to new tissue depends, not on the proximity of the developing tissue to the field of arborisation of pre-existing vessels, but on the nature of its epithelium.

II. A number of lungs which exhibited pathological lesions were injected to show the distribution of the pulmonary and bronchial arteries in the new tissue. It was found the actively growing carcinomata were avascular, but if they (or any other type of avascular growth) later developed a fibrous area, it was supplied by the bronchial artery. Any new growth associated with fibro-vascular tissue was supplied by the bronchial artery. W. concluded from this that if a tissue develops in the lung which is usually supplied by the systemic circulation, the vessels which grow into it are derived from the bronchial circulation. This development may be directly associated with the excitation of collagenous tissue to further development of new tissue.

III. This article contains conclusions drawn from I and II; it is stated that in the lung, as in the liver, the systemic capillaries are associated with a sheath of collagenous tissue, whereas the liver sinusoids and pulmonary artery capillaries are not. In lesions where there is a growth of tissue associated with collagen fibres, whatever the exciting cause may be, there is a growth of a systemic arterial supply.—C. W. OTTAWAY.

I. DRAGSTEDT, L. F., VAN PROHASKA, J., & HARMS, H. P. (1936). **Observations on a Substance in Pancreas (a Fat Metabolizing Hormone) which Permits Survival and Prevents Liver Changes in Depancreatized Dogs.**—*Amer. J. Physiol.* **116.** 36-37.

II. CHANNON, H. J., LOACH, J. V., & TRISTRAM, G. R. (1938). **The Effects of Pancreatic Extracts on Fat Deposition in the Dietary Fatty Liver.**—*Biochem. J.* **32.** 1332-1344. 6 tables. [19 refs.]

III. ANON. (1938). **The Fatty Liver.**—*Lancet.* **235.** 787. [2 refs.]

I. A brief description of a method of preparing an alcoholic extract of ox pancreas. This extract was found to be effective in preventing and curing fatty infiltration and degeneration of the liver in depancreatized dogs adequately treated with insulin.

II. The experiments here recorded clearly show that dilute alcoholic extracts of pancreas contain a factor other than choline which prevents fat deposition in the liver. The nature of this factor was not determined, but it was shown not to be protein.

III. A short discussion on the above papers. It is suggested that the results obtained considerably shake the classical concept that fatty infiltration of the liver is due to a direct toxic action on the liver cells by various poisons.—N. J. S.

BAUERNFEIND, J. C., SCHUMACHER, A. E., HODSON, A. Z., NORRIS, L. C., & HEUSER, G. F. (1938). **A New Factor Required for Growth and Reproduction in the Domestic Fowl.**—*Proc. Soc. exp. Biol., N.Y.* **39.** 108-111. 2 tables. [6 refs.]

A diet adequate in all known vitamins except the antidermatosis vitamin and nicotinic acid was fed to hens and chicks. After addition of these two factors as supplements to the basal diet, the hatchability and growth were not significantly improved and it was concluded that a factor is required for growth and reproduction in the domestic fowl other than the vitamins A, B, B_4, B_6, D, E, K, riboflavine, the chick antidermatosis vitamin, nicotinic acid, factor W, the anti-encephalomalacia factor and the essential fatty acids. The factor is present in cereals, yeast and milk and is destroyed by heating in a dry atmosphere for 36 hours at 120°C.—R. ALLCROFT.

FOLLEY, S. J. (1938). **Experiments on the Relation between the Thyroid Gland and Lactation in the Rat.**—*J. Physiol.* **93.** 401-412 4 figs., 1 table. [17 refs.]

As a result of the removal of the thyroids and the immediately associated parathyroid tissue of rats on the sixth day of lactation, there was a marked decline in lactation as judged by the effect on the average growth rates of their sucklings. Such rats subsequently treated with thyroxine and parathormone lactated no better than untreated, thyroidectomized rats.

F. considers that until technique for milking out small animals and for microscopic analysis of milk has been developed, the best way of studying the role of endocrine glands in lactation is by experimenting on animals such as cows and goats. H. V. HUGHES.

FAIRLEY, N. H. (1937). **A New Blood Pigment (Pseudo-Methaemoglobin).**—*Nature, Lond.* **139.** 588.

A pigment, pseudo-methaemoglobin, is described by F. as existing in the blood plasma of patients suffering from blackwater fever. Spectroscopic examination has shown clearly that this pigment is distinct from methaemoglobin. Experimental evidence indicates that the plasma has the power of converting either extracorpuscular haemoglobin or methaemoglobin into pseudo-methaemoglobin, and it is suggested that in severe intravascular haemolysis it is this new pigment and not methaemoglobin that is formed.—R. N. C. AITKEN.

I. BARCROFT, J., KENNEDY, J. A., & MASON, M. F. (1939). **The Blood Volume and Kindred Properties in Pregnant Sheep.**—*J. Physiol.* **95.** 159-172. 12 figs. [6 refs.]

II. BARCROFT, J., & KENNEDY, J. A. (1939). **The Distribution of Blood Between the Foetus and the Placenta in Sheep.**—*Ibid.* 173-186. 13 figs. [9 refs.]

III. BARCROFT, J., KENNEDY, J. A., & MASON, M. F. (1939). **The Direct Determination of the Oxygen Consumption of the Foetal Sheep.**—*Ibid.* 269-275. 1 fig., 1 table. [12 refs.]

I. Observations were made on the blood volume, plasma volume, corpuscle volume, the haematocrit reading, the haemoglobin value per c.c. of blood, and the total haemoglobin in five pregnant sheep with three hysterectomized sheep as controls.

The blood volume increases up to about the 45th day of pregnancy and then falls until within a few days of parturition, when it reaches its greatest height. This is due to an increase in plasma volume which rises up to the 40th or 50th day, then remains fairly steady until shortly before parturition when it rises again. The corpuscle volume falls slowly until about the 50th to the 70th day when it tends to rise very slowly.

The total haemoglobin in the hysterectomized sheep showed for some reason unknown a fall during February and March followed in April and May by a rise. In the pregnant sheep the total haemoglobin was constant during the first 50 days, after which a definite fall occurred. This was followed by a gradual rise to near the normal towards the end of pregnancy.

II. The authors carried out experiments, the technique of which is described, to find the relative quantities of foetal blood in the foetus and placenta respectively throughout the period of pregnancy; they used the dye-injection method of KENNEDY and MILLIKAN [(1938). *J. Physiol.* **93.** 276].

In general the proportion of blood in the foetus to that in the placenta increases as time goes on. At 100 days about half the blood is in each, whilst at 140 days four-fifths or more is in the foetus. The cotyledons do not increase in weight after about half-way through gestation.

The flow of foetal blood through the uterus increases more or less proportionately with the weight of the foetus. At 110 days the foetal arterial pressure is about 38 mm. of mercury and at 140 days 75 mm.

The weight of single foetuses and twins is about equal at a given age up to the 135th day, thereafter the twins weigh a little less than single foetuses.

III. The authors describe a method of ascertaining the oxygen consumption of the foetal sheep. In seven experiments the average value was 0·0043 c.c. per gram of foetus per minute. That this value is higher than that previously estimated by one of the authors may be due to the fact that the cardiac outputs obtained by the cardiometer were low owing to errors in the instrument itself, and that shock and vascular collapse may have resulted from the surgical interference attending its use. Moreover a general anaesthetic was used in previous experiments, whereas in the present experiments a spinal anaesthetic was used.

The rates of blood-flow through the umbilical cord varied with the age and size of the foetus, the highest and lowest values in a foetus of 111 days being 600 c.c. and 111 c.c. per minute respectively.—H. V. HUGHES.

MASSON, G. (1938). Hormones sexuelles et diagnostic de la gestation chez la jument. [**Sex Hormone Diagnosis of Pregnancy in Mares**].—*Canad. J. comp. Med.* **2.** 73-83. 2 figs. [Numerous refs.] [In French].

The author reviews biological and chemical tests employed for the diagnosis

of pregnancy. The four biological tests reviewed are said to give excellent results but the author's preference is for Friedman's test, which is specific between the 6th week and 4th month. The best of the chemical tests is Cuboni's, which is rapid and remains specific until the end of gestation. The above tests are applicable to mares but not cows.—L. M. HEATH.

SATO, S., & HOSHI, S. (1938). **Reproduction in Mares. IV. Periodic Changes in the Vulva, Vagina and Cervix.**—*J. Jap. Soc. vet. Sci.* **17.** 89-109 of pt. 2. 10 figs., 5 tables. [In English: Japanese summary pp. 225-227 of pt. 1]. [See also *V. B.* **5.** 385].

Twelve mares bred in Korea were kept under observation for one and a half years. Oestrus was detected by means of a stallion and the changes in the ovary, vagina, vulva, and cervix were observed by vaginal and rectal examination.

(1) *Periodic changes of the vulva.* In six of the animals at the beginning of oestrus the labia relaxed, the relaxation reaching its height a few days before ovulation. Simultaneous with ovulation contraction began. The changes in the others were not so marked. The commissure became shorter gradually till the 7th day after ovulation and remained in its shortest state till 2 days before the next oestrus.

(2) *Periodic changes of the vagina.* Hyperaemia generally began one or two days before oestrus, reached its climax three or four days before ovulation, and disappeared gradually after ovulation. The amount of mucus present followed a course similar to the degree of hyperaemia; only in diseased mares was there ever a very large amount present, and in these individuals it sometimes trickled from the vulva.

(3) *Periodic changes of the cervix.* At the onset of oestrus the cervix began to swell and the enlargement reached its greatest extent as a rule about two or three days before ovulation. This was accompanied by a relaxation of the structure; this relaxation had completely disappeared by the 5th or 6th day after ovulation.

The above are the findings of the authors during normal oestral cycles in mares. The authors conclude that they are produced by the oestrogenic hormone and state that when the function of this oestrogen is too short or too slight to produce complete oestrus, mares show none or few of the symptoms except libido. They are of the opinion that the function of this hormone is not subject to the " all or none " law. During oestrus there occurs, in the following order, swelling of the cervix, hyperaemia of the vaginal mucous membrane, increase in amount of mucus, elongation of the vulva, and relaxation of the cervix. After each change reaches its maximum, retrogression occurs in the same order and is complete by the 6th or 7th day after ovulation.—J. G. MURRAY.

FLEXNER, L. B. (1938). **Changes in the Chemistry and Nature of the Cerebrospinal Fluid during Fetal Life in the Pig.**—*Amer. J. Physiol.* **124.** 131-135. 1 table. [12 refs.]

Distribution ratios of Cl, Na and urea between cerebrospinal fluid and blood plasma were determined during foetal life in the pig. Up to an intra-uterine age of 40 days these substances in the C.S.F. were in equilibrium with the plasma and consequently the C.S.F. could be considered an ultrafiltrate of the plasma at this stage. In foetuses of 43 days of intra-uterine age or older, these substances were no larger in equilibrium and therefore in the three days interval between the two ages specified, the C.S.F. is believed to change from an ultrafiltrate to a secretion of the chorioid plexus.—R. ALLCROFT.

GLICK, D., LEWIN, A., & ANTOPOL, W. (1939). **Occurrence of Choline-Esterase in Swine.**—*Proc. Soc. exp. Biol., N.Y.* **40.** 28-32. 1 table. [11 refs.]

The choline-esterase activities of various swine organs and tissues were estimated, and particularly high activities were observed in the cases of the lachrymal and salivary glands, the Fallopian tubes, alimentary mucosa, and the medulla oblongata.—R. ALLCROFT.

TECHNIQUE AND APPARATUS

JOHANNSON, A. (1938). Die Grundlagen einiger Bakterienfärbungen. [**Fundamentals of Bacterial Staining**].—*Zbl. Bakt. I.* (*Orig.*). **141.** 424-442. 5 figs., 9 tables.

It is claimed that Osol's modification is superior to the orthodox Ziehl-Neelsen method. This modification consists of staining with hot, concentrated carbol fuchsin, decolorizing with 5% sulphuric acid and treating with 10% sodium sulphite in 20% alcohol. In preparing films of sputum for acid-fast staining, it is claimed that better results are obtained by using films which are not fixed but covered with boiling stain for ten minutes.

Analysing the principles of complex staining methods, J. concludes that one of three fundamental systems are always involved, *viz* :– (a) simple decolorization as with alcohol or acetone ; (b) primary precipitation of the stain followed by decolorization, one agent serving the double function, as with mineral acids, and (c) mordanting with iodine or metallic salt solutions followed by decolorization with a solvent such as alcohol.

Returning to the question of the acid-fast group, the opinion is expressed that the black granules seen in tubercle bacilli after overstaining with methylene blue are true metachromatic granules and that they are the mature form of the Much granule.—E. J. PULLINGER.

RAKETTE, H. (1937). Ueber Sporenfärbungen. [**Spore Staining**].—*Arch. wiss. prakt. Tierheilk.* **72.** 338-352. [Numerous refs.]

A brief description is given of over 30 of the more important methods now in use for staining bacterial spores. In his own experience R. found both malachite green and fuchsin very efficient for staining all the various spores which he tested, and superior in facility of handling and rapidity to all the other stains ; fuchsin, however, has the disadvantage of not being readily displaced by other stains. He then describes a new method which he devised for staining the spores with malachite green, which he claims to be a simplification of Wirtz's method, saving much time and labour.

WRIGHT, Elizabeth V., & KERTSEN, H. (1937). **An Apparatus for Measuring Turbidity of Bacterial Suspensions.**—*J. Bact.* **34.** 581-583. 2 figs.

A brief description is given of a simple and inexpensive photometric apparatus for determining relative turbidities in convenient numerical units. The use of the apparatus is illustrated by curves obtained from the growth of a broth culture of *Staphylococcus aureus* under various conditions.—R. ALLCROFT.

LIBBY, R. L. (1938). **The Photronreflectometer—an Instrument for the Measurement of Turbid Systems.**—*J. Immunol.* **34.** 71-73. 1 fig., 1 table.

A new optical instrument for the quantitative measurement of turbid or opalescent systems is briefly described. By it, antigen-antibody precipitation

reactions can be accurately measured and differences of as little as 0·05 mg. of suspended material may be detected. Data obtained from suspensions of $BaSO_4$ in water are given to illustrate the accuracy and sensitivity of the instrument.
—R. ALLCROFT.

WOOD, H. (1938). **A Tray for Dehydration, Clearing and Paraffin Impregnation of Large Quantities of Tissue.**—*Arch. Path.* **26.** 532-534. 1 fig.

This tray, constructed entirely of perforated sheet Monel metal, has a diameter of 7½ in. and a depth of 2 in. and provides 36 separate compartments. For dehydration and clearing the whole tray is immersed in large jars containing the solutions, and then into receptacles containing " soft " and " hard " paraffin. The use of this simple apparatus thus eliminates much of the time and effort usually expended on preparing large numbers of histological sections.—R. ALLCROFT.

RIMINGTON, C., & FOURIE, P. J. J. (1938). **A Rapid Phase Test for Distinguishing between Carotinoid and Bile Staining of Fat in Carcasses.**—*Onderstepoort J. vet. Sci.* **10.** 439-441. [3 refs.]

A rapid phase test is described for the differentiations of carotins and bile pigments in yellow carcasses. Two grams of fat free from blood are heated in 5 c.c. of a 5% aqueous solution of sodium hydroxide. After cooling to 40°-50°C., add half to an equal volume of ether. A yellowish discoloration of the top ether phase indicates plant pigments and a yellowish green discoloration of the lower water phase indicates presence of bile pigments. This test therefore furnishes information concerning the presence or absence of one or both kinds of pigment.

MIRECKIĬ, O. J. (1937). Podsčet jaič v tele parazitičeskih cerveĭ. [**A Method for Calculating the Eggs Contained in the Body of Helminths**].—*Papers on Helminthology, Commemorating 30 Year Jubilee of Prof. K. I. Skrjabin.* pp. 396-397. 1 table. Moscow: Lenin. Acad. Agric. Sci.

The uterus of the worm is removed and placed in 10% caustic alkali to set free the eggs. The egg content is then calculated with the aid of a haemocytometer.

BRÜGGEMANN, H. (1937). Vergleichende Untersuchungen verschiedener Flotationsmedien zum Nachweis von Leberegeleiern im Kot von Schaf und Rind. [**Comparison of Various Flotation Media for the Demonstration of *Fasciola* Eggs in the Faeces of Sheep and Bovines**].—*Inaug. Diss., Hanover.* pp. 34. 1 table. [Numerous refs.]

Experiments were carried out to find a good substitute for water-glass solution as a medium for flotating *Fasciola* eggs. A solution of concentrated aqueous potassium hydroxide, specific gravity 1·56, was tested, but the microscope fields were blurred with air bubbles and pieces of faeces. A mixture of 100 c.c. water, 110 g. potassium hydroxide, and 110 g. of sugar was then tested and proved itself to be a good substitute for water-glass solution. It does not damage any apparatus used and mild infestations can be diagnosed with certainty. Centrifugation is recommended when it is employed.—A. L. WILSON.

FRASER, H. F., TOPPING, N. H., & SEBRELL, W. H. (1938). **The Assay of Urine in Canine Blacktongue by the Use of *Shigella paradysenteriae* (Sonne).**—*Publ. Hlth Rep., Wash.* **53.** 1836-1842. 1 table. [6 refs.]

A method is described for assaying the bacterial growth-promoting properties of urine by the use of *S.p.* (*Bact. flexneri*) which requires nicotinic acid or its related compounds. A marked and consistent decrease occurred in the bacterial growth-promoting properties of the urine collected from six dogs after 31-52 days on a

blacktongue-producing diet; after administration of nicotinic acid to the dogs, the growth-promoting value of their urine increased or returned to normal. In every instance there was a close correlation between the results of the biological assay and the clinical condition of the animal.—R. ALLCROFT.

STEYN, D. G. (1938). **The Detection of Strychnine in Carcasses and Corpses.**—*Onderstepoort J. vet. Sci.* **10.** 411-418. 2 tables. [5 refs.]

S. discusses the results of experiments carried out on 29 dogs to ascertain (a) for what period after death strychnine is still detectable in carcasses, and (b) what tests are essential for detecting the presence of strychnine. It has been definitely established that it is essential to apply (a) the taste test, (b) the colour test (Otto's test) and (c) a biological test to the materials (purified chloroform extracts) under examination, especially when only minimal quantities of strychnine are present. Certain ptomaines appear to give colour reactions and to induce spasms in white mice similar to those caused by strychnine. The view that strychnine is still detectable in carcasses for periods up to 12 years or longer after death appears to be fallacious.

MISCELLANEOUS

EDWARDS, S. J. (1938). **Biennial Reviews of the Progress of Dairy Science. Section E. The Diseases of Dairy Cattle. I. Mastitis. II. Contagious Abortion. III. Tuberculosis.**—*J. Dairy Res.* **9.** 356-377. [Num. refs.]

This review, which must be read in the original, deals with these diseases under the following headings :– mastitis—bacteriology, diagnosis, control, staphylococcal type of infection and influence of milk yield; contagious abortion—pathogenesis in cattle, pathogenicity of *Brucella abortus* for other animals, diagnosis, immunization and control; and tuberculosis—pathogenicity of *Mycobact. tuberculosis*, diagnosis, non-specific reactions to the tuberculin test, immunization and eradication.—J. E.

GODDARD, E. J. (1936). **The School of Veterinary Science, University of Queensland.**—*Qd agric. J.* **45.** 444-448. 1 photograph.

The inauguration of the Faculty of Veterinary Science in the University of Queensland marked an important advance in the attack on the special problem affecting animal industry in northern Australia. The establishment of the new school was designed to meet the persistent difficulty of providing an adequate scientific veterinary personnel for research, administration and extension work. Only a Queensland veterinary school was considered able to satisfy the needs of the State in this connection.—H. B. CARTER.

ANON. (1937). **The National Field Station, "Gilruth Plains", Cunnamulla, Queensland.**—*J. Coun. sci. industr. Res. Aust.* **10.** 351-352.

An experimental station of some 40,000 acres has been established capable of running 5,000 sheep. The station is under the direction of the Chief of the Division of Animal Health and Nutrition and will be used for investigations into various economic problems affecting the sheep industry, principally the control of blowfly strike, but also problems in nutrition and wool production.—H. B. C.

MELLANBY, E. (1938). **The State and Medical Research.**—*Lancet.* **235.** 929-936.

An outline is given of the modern movement of state support for medical

research as seen in the activities of the Medical Research Council. The compatibility of state control of medical research with freedom to the investigator is discussed and an account is given of how state funds are used for the purpose of promoting discovery in medicine.

The Medical Research Council consists mainly of a group of experts in medical research with full authority to use and control the public money placed at their disposal, independently of all other bodies. Political influence, it is claimed, can have no detrimental effect upon the work of the Council as at present constituted, and the constant change of personnel—an individual's term of office is four years—prevents the continuance of any biassed attitude on the part of the Council.

The Council relies for advice upon 27 committees composed of voluntary workers, who possess detailed technical knowledge and sound judgment. The annual state grant to the Council is now £195,000. In addition certain other funds are at its disposal for the encouragement of research.

The Council disposes of the money chiefly by the maintenance of the National Institute for Medical Research and of a number of research units at various centres, and also by the provision of grants to individual workers.

M. stresses the value of the experimental method in research, and believes that the sooner the investigator recognizes the truth of both the physiological and the invasive bases of disease and the close interaction of these factors, the quicker will be the advance of medicine.—H. V. Hughes.

OFFICIAL AND OTHER REPORTS

Great Britain. (1938). **Report of the Chief Veterinary Officer of the Ministry of Agriculture and Fisheries for the Year 1937 of the Proceedings under the Diseases of Animals Acts, 1894 to 1937.**—*Proc. Dis. Anim., Lond. 1937.* pp. 9-77. Numerous tables.

Part I of the report deals with new legislation, *viz*, Part IV (Diseases of Animals) of the Agriculture Act, 1937, and the Exportation of Horses Act, 1937. The purpose and effect of the former is considered and details of the organization and establishment of the new centralized State Veterinary Service are given. The veterinary functions transferred from local authorities to the Ministry are defined, as are also the powers and duties of a non-veterinary character retained by local authorities. For the purposes of field duties, Great Britain has been divided into 78 Divisions, each in charge of a Divisional Inspector. The divisions are grouped into 22 Areas, each in charge of a Superintending Inspector. Part IV of the Agriculture Act, 1937, came into operation on April 1st, 1938.

Part II of the report deals with the incidence of notifiable contagious diseases of animals.

During 1937, 743 cases of Anthrax were confirmed, as compared with 468 in 1936. A table of probable origins and details of the species and numbers of animals attacked are given. There were 879 deaths, an average of 1·18 per outbreak. According to returns furnished by local authorities, 22,425 cattle were slaughtered under the Tuberculosis Order of 1925 and the total sum paid as compensation was £106,477, an average of £4 15s. per head. The numbers of affected animals in the four categories were :– (a) cows giving tuberculous milk, 383 ; (b) cows with TB. of the udder, 6,261 ; (c) bovine animals with tuberculous emaciation 3,868, and (d) bovine animals with a chronic cough and clinical signs of TB., 11,850. At the end of the year there were 813 Attested Herds in England

and Wales, comprising 37,000 cattle. Details are given of the revised Attested Herds Scheme introduced on June 1st, 1937.

During the year there were 187 outbreaks (175 in England, 8 in Wales and 4 in Scotland) of FOOT AND MOUTH DISEASE. Few outbreaks occurred during the first nine months of the year, but a dangerous series commenced in October, 1937, and extended until March, 1938. The whole series is included in this report, and in addition details are given of the character and history of this disease in Great Britain, and a description of the policy and procedure for its eradication. The number of suspected outbreaks of SWINE FEVER was 11,576; of these, 982 were confirmed, as against 1,873 in 1936. Approximately 92% of the outbreaks occurred in the Scheduled Area to which the Regulation of Movement of Swine Order of 1922 applies. In the course of SWINE FEVER diagnosis 1,478 cases of SWINE ERYSIPELAS were detected, a decrease of 27·7% as compared with 1936.

There were 115 outbreaks of EQUINE PARASITIC MANGE, involving 33 counties, as compared with 111 outbreaks in 35 counties in 1936. During the year 253 outbreaks of SHEEP SCAB were confirmed as compared with 255 in 1936; the distribution was 147 in England, 70 in Wales, and 36 in Scotland. Areas to which Parts II and III of the Sheep Scab Order of 1928 were applied are described. Sixteen sheep dips were approved in 1937.

The provisions of the Warble Fly (Dressing of Cattle) Order of 1936 were not altered during 1937.

Part III deals with the new poultry orders issued in December, 1936. 73 cases of FOWL PEST (including FOWL PLAGUE and NEWCASTLE DISEASE) were reported, but in no case was disease confirmed.

Part IV deals with the subject of importation, with regard to preventing the introduction of contagious diseases of animals in Great Britain. One case of TUBERCULOSIS (as defined in the Tuberculosis Order of 1925) and 75 cases of SHEEP SCAB were found in imported animals in the landing places. Two cases of RABIES were confirmed in dogs undergoing isolation on quarantine premises. During 1937, 1,348 canine and feline animals were imported into Great Britain, including 151 performing dogs and 20 performing cats, 27 dogs for immediate re-exportation, and 85 felines (other than domestic cats) and 58 canines (other than domestic dogs) imported for exhibition. This section also deals with the operation during the year of the following orders :– Foreign Hay and Straw Orders; Markets, Sales and Lairs Orders; Diseases of Animals (Importation of Therapeutic Substances) Order; and the Diseases of Animals (Disinfection) Order.

Part V deals with the protection of animals and poultry during transit and with exportation of horses. Tables record the casualties in transit amongst animals imported into Great Britain during 1937; there were 206 casualties in 1,516,602 animals from Northern Ireland and Eire, 59 in 9,824 animals from Canada, and none in animals from the Channel Islands and the Isle of Man. The Ireland figures do not include the loss of 321 cattle due to the sinking of SS. " Lairdsmoor " as the result of a collision in fog. New legislation dealing with exportation of horses came into force during 1937, *viz*, the Exportation of Horses Act, 1937. The effect of the new Act and the consequent order is explained.

Part VI deals with the certification of exported pedigree and other livestock, raw animal products, fertilizers, etc. Details are given of the conditions and rules which must be complied with before cattle can be sent to the London Quarantine Station. During 1937, 759 animals passed through the Quarantine Station for export to the Dominions and Colonies. Certificates of approval were issued in respect of 63 factories in connexion with the export of fertilizers and feeding stuffs to South Africa, Canada, Jersey, Guernsey and the Netherlands.

The appendixes give statistics relating to notifiable diseases among animals in Great Britain, details of contagious animal diseases in European countries in 1936 and 1937, and statistics relating to the number of animals in Great Britain and to animals imported and exported.—J. C. WALLACE.

GREAT BRITAIN. (1938). **The Work of the Veterinary Laboratory and Research Institute, New Haw, Weybridge.** [ANDREWS, W. H.]—*Proc. Dis. Anim. Lond., 1937.* pp. 77-88.

The main activities of the Laboratory are dealt with under two headings, *viz* :–

ROUTINE SERVICES.—The following specimens were received for the purposes of diagnosis in suspected cases of the diseases dealt with under the Diseases of Animals Acts :– 1,034 of ANTHRAX (879 positive); 1 of GLANDERS (negative); 2,600 of SWINE FEVER (1,035 positive); 14 of RABIES (2 positive); 77 of FOWL PLAGUE (all negative), and 51 of SHEEP SCAB (38 positive). The two cases of RABIES occurred in imported dogs during their quarantine period. In addition, 5,652 specimens were examined in which there was no suspicion of any of the notifiable diseases.

During the year, 22,219 doses of anti-abortion "A" vaccine were supplied and 1,775 agglutination tests carried out in connexion with BOVINE ABORTION. 217 doses of BCG vaccine were issued for use in selected herds. Sixteen cattle were immunized against PIROPLASMOSIS and ANAPLASMOSIS. 169,258 aggl. tests were conducted for PULLORUM DISEASE. 21,707 doses of FOWL TYPHOID vaccine were supplied. FOWL POX vaccine was issued for the inoculation of 273,066 poultry.

RESEARCH.—In connexion with CONTAGIOUS ABORTION, an investigation into the occurrence and distribution of *Brucella abortus* in the bodies of cows giving low titre aggl. reactions was in progress. Work under the Agricultural Research Council's eradication scheme was continued, and a form of brucellin was prepared and issued to Research Institutes for experimental purposes. The fate of *Br.a.* in calves, the progeny of infected " carrier " cows, and in calves artificially infected was studied.

In TUBERCULOSIS, research into infection of bovines and pigs with the avian type of *Mycobacterium tuberculosis*, and on the so-called " skin tuberculosis " was carried out. P.M. and biological examinations were made on certain cattle which had reacted to tuberculin in field tests. The value of various methods of inoculation against INFECTIOUS LARYNGOTRACHEITIS OF FOWLS, the wide variation in the virulence of different strains of the virus, the viability of the virus, the efficacy of various methods of disinfection, and the susceptibility of common species of birds to the virus were studied.

Other investigations included work on the resistance of the SWINE FEVER virus, on INFECTIOUS EQUINE ANAEMIA, EPIZOOTIC ADENOMATOSIS of sheep [see *V. B.* **8.** 651.] and PARASITIC GASTRITIS of sheep.

The biochemistry section dealt with metabolic disorders of farm animals. Among the conditions considered were HYPOMAGNESAEMIA, HYPOCALCAEMIA associated with HYPOMAGNESAEMIA and HYPERMAGNESAEMIA, KETOSIS in the dairy cow, and PREGNANCY TOXAEMIA and LAMBING SICKNESS in ewes. Work has been done on the veterinary physiology of copper, lead and manganese, on lead poisoning and on the therapeutic use of copper compounds and chronic copper poisoning.

Avitaminosis-A was studied in association with the National Institute for Research in Dairying, Reading. It was found that healthy pigs, anaemic pigs and

vitamin-depleted pigs were equally susceptible to *Salmonella cholerae-suis* infection.

Reference is made to the survey of poultry P.M. results carried out from 1933 to 1936, the results of which have been published [*V. B.* **8.** 524]. An investigation was begun of the tumours occurring in fowls received for routine P.M. examination.

—J. C. WALLACE.

CANADA. (1937). **Report of the Veterinary Director General for the Year ending March 31st, 1937.** [HILTON, G.] pp. 46. Numerous tables. Ottawa: J. O. Patenande. [8vo].

The reputation of the Dominion for freedom from FOOT AND MOUTH DISEASE and other animal plagues prevalent in other countries has been maintained, and the small outbreaks of MANGE in cattle and horses, SWINE FEVER, ANTHRAX and GLANDERS during the period under review were promptly dealt with and controlled.

The major expense of this branch of the Department of Agriculture is in connexion with the control of bovine TUBERCULOSIS, yet all the demands for this service cannot be satisfied. To facilitate the movement of non-reacting cattle between Canada and the United States, a reciprocal agreement was arranged, the full benefits of which, however, have not been realized owing to the varying laws of the individual states.

Under the optional BRUCELLOSIS control policy, reactors to the blood test are now ear-marked, despite which there is a gradual increase in the number of herds coming under this scheme. Re-infection was only found in herds to which additions, purchased on the open market, were made.

Included in this report are the individual reports of the three divisions comprising the Branch, which are abstracted elsewhere in this *Bulletin*.—L. M. HEATH.

CANADA. (1937). **[Report of] Contagious Diseases Division [1936-37].** [CAMERON, A. E.]—*Rep. vet. Dir. Gen. Dep. Agric. Can., 1936-37.* pp. 8-29. Numerous tables.

Freedom from RABIES for over two years, from DOURINE for seventeen years and from SHEEP SCAB for nine years is reported. One case of SARCOPTIC MANGE was, however, reported in an isolated flock of sheep.

After one year in which no ANTHRAX occurred two small outbreaks were dealt with in the Province of Quebec; 14 animals were affected. An outbreak of GLANDERS was controlled in Saskatchewan. Mange in cattle was present in Prince Edward Island, New Brunswick, Ontario and Alberta; MANGE in horses was found in Quebec, Ontario and Manitoba. Two outbreaks of SWINE FEVER in Ontario were controlled.

Under the three plans in operation for the eradication of bovine TUBERCULOSIS, in two of which compensation is paid, more than 1,250,000 cattle were tested with tuberculin, with 35,804 reactors. The total compensation paid was $1,039,702.79. There are now 7,827 fully accredited herds, while 1,197 are in the process of accreditation and there is a waiting list of 109. Under the Restricted Areas Plan the percentage of reactors was higher than under the other two plans, and varied from 0·1% in a district in Quebec to over 25% in one district in Manitoba. The average was about 4·5%.

For the control of BOVINE CONTAGIOUS ABORTION 1,650 herds are under supervision comprising 42,900 cattle; no compensation is paid.

Other activities of the Division were the enforcement of regulations regarding garbage feeding of swine, milk export inspection and inspection of stock yards and

cars. The remainder of the report is made up of appendices in the form of extracts of Orders-in-Council and copies of Ministerial Orders issued during the year. —L. M. HEATH.

CANADA. (1937). **[Report of] Meat and Canned Foods Division [1936-37].** [BARNES, R.]—*Rep. vet. Dir. Gen. Dep. Agric. Can., 1936-37.* pp. 30-36. 6 tables.

Marked increase in cattle, swine and poultry slaughter is noted, while there was a decrease in the number of sheep slaughtered. A list of the 82 establishments operating under the Meat and Canned Foods Act is given. By Order in Council two Regulations were amended.

The remainder of the report consists of tables containing statistical data concerning cattle, sheep and swine slaughtered in the different provinces, including the condemnations, the sex of matured cattle slaughtered, the dressed weight of slaughtered animals, exports and imports of edible meats, the animal slaughter since 1908 and the diseased conditions found in animals and poultry slaughtered under inspection for 1936-37.—L. M. HEATH.

CANADA. (1937). **[Report of] Pathological Division [1936-37].** [WATSON, E. A.] —*Rep. vet. Dir. Gen. Dep. Agric. Can., 1936-37.* pp. 37-42. 2 tables.

This report is a condensed summary of work undertaken during 1936-37, at the Animal Diseases Research Institute, Hull, two branch laboratories and a Field Station ; it is divided into Biological Products, Diagnostic Services and Research. Biological products produced were tuberculin, mallein, johnin, *Br. abortus* antigen and anti-distemper serum. Diagnostic services were given on over 300,000 individual specimens originating from the domesticated animals, poultry, fur bearers and wild animals and birds. Research was undertaken on the virus of distemper, infectious bovine abortion, skin lesions (tuberculosis) of cattle, infectious mastitis, Johne's disease, tuberculosis, *Corynebacterium pseudotuberculosis* infection of horses, rheumatic and skin disease of swine, and bovine haematuria.

The cultivation of distemper virus on the chorio-allantoic membrane of chick embryos is reported. The purified protein derivative of johnin was recovered. Experimentally ammonium succinate was found to be a satisfactory substitute for the more expensive asparagin used in synthetic media for tne preparation of tuberculin.—L. M. HEATH.

CANADA. (1937). **Report of the Poultry Pathology Laboratory for the Fiscal Year Ending March 31, 1937.** [WEAVER, C. H.]—*Rep. vet. Dir. Gen. Dep. Agric. Can., 1936-37.* pp. 43-46. 2 tables.

The report is a review of Poultry Conferences attended, of routine diagnostic services and of research in progress. One of the accompanying tables shows twenty diseased conditions identified, with their seasonal distribution. It is of interest to note that infectious laryngotracheitis and infectious bronchitis may be accurately differentiated and that their seasonal occurrence is quite different. The other table indicates the source and seasonal distribution of blood samples submitted to agglutination tests for *Salmonella pullorum* infection. Research was continued on the mortality in adult laying fowls and on coccidiosis.—L. M. HEATH.

CANADA, BRITISH COLUMBIA. (1938). **[Report on] Nutrition and Animal Health [1937].** [GUNN, W. R.]—*Rep. Dep. Agric. Brit. Columbia, 1937.* pp. K65-K66.

G. suggests that proper nourishment would materially reduce losses of livestock in British Columbia. In one district the incidence of disease conditions

including timber milk-vetch (*Astragalus campestris*) poisoning (" Knock heel ") was reduced by a change of management accompanied by mineral supplements to the diet. The administration of milk was found beneficial in pregnancy disease of sheep. Following a modified plan (undisclosed) in feeding, losses in swine were reduced.—L. M. HEATH.

CANADA, BRITISH COLUMBIA. (1938). **Report of the Chief Veterinary Inspector. [1937].** [KNIGHT, A.]—*Rep. Dep. Agric. Brit. Columbia, 1937.* pp. K71-K74.

No serious outbreak of disease was reported during period under review. Sporadic cases or small localized outbreaks of the following were noted : BLACKLEG, KERATITIS in cattle, HAEMORRHAGIC SEPTICAEMIA, CALF DIPHTHERIA, pulmonary mixed infection, COCCIDIOSIS, FOOT ROT, VAGINITIS, PLANT POISONING and one case of ACTINOMYCOSIS.

The administration of a commercial bacterin was apparently beneficial in KERATITIS. The loss from COCCIDIOSIS in calves is not great but may be reduced by better sanitation and feeding after weaning. FOOT ROT of sheep might be controlled better if adequate ranges free of disease were available. No remedy has been found for VAGINITIS of cattle, the outstanding result of which is failure to conceive. Fortunately after the disease has run its course an immunity appears to be established against renewed infection. HELMINTHIASIS of sheep and swine are under control as a result of advice given farmers by the veterinary staff. Only 0·62% of over 12,000 animals reacted to the tuberculin test.—L. M. HEATH.

NEW ZEALAND. (1938). **Report of the Acting Director-General for the Year ending 31st March, 1938.** [FAWCETT, S. J.]—*Rep. Dep. Agric. N.Z., 1937-1938.* pp. 4-7. 1 table.

Since the adoption of refrigeration for meat export purposes animal production had been perhaps more intensified in New Zealand than in any other country. This intensification had brought in its train serious problems which urgently demanded investigation.

There is reference to the annual report 1936-1937, in which attention was drawn to the fact that grassland management has been more from the agronomic than the veterinary angle and was unbalanced, and also that stock losses were costing the country vast amounts annually while research into animal disease was neglected. Since that time a severe outbreak of FACIAL ECZEMA [PHOTOSENSITIZATION] had drawn attention to the need for intensified investigation of disease and to measures for maintaining the flocks and herds in a healthy condition.

—L. W. N. FITCH.

TANGANYIKA TERRITORY. (1938). **[Report on] Animal Husbandry [1937].**—*Rep. Dep. Agric. Tanganyika, 1937.* Pt. I. pp. 18-19.

This section deals briefly with progress in the development of herds of cattle, at the various agricultural experimental stations, for draught and milk purposes, but even more so for the production of manure and compost. A short account is given of a dairy herd at Morogoro, situated in an area infested with both East Coast fever and tsetse. By regular dipping to control the former disease, therapeutic treatment of trypanosomiasis, and stall feeding, it was proved that grade dairy cattle could be maintained usefully under very adverse conditions. The close co-operation and practical assistance of the Veterinary Department are stressed.

—S. A. EVANS.

GREAT BRITAIN. (1938). **Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1937.** pp. 235. Numerous tables, 9 appendixes. London: H.M. Stat. Off. [8vo] [3s. 6d.]

GENERAL DISEASES.—Statistics are given of information collected on UNDULANT FEVER. An investigation was in progress to explain why, if raw milk is accepted as the source of infection, many drinkers of infected milk escape this disease. PSITTACOSIS was diagnosed in seven birds from Australia. The CANCER problem is discussed.

MILK HYGIENE.—From January 1st, 1937, Local Authorities became the licensing authorities under the Milk (Special Designations) Order, 1936. Differences in administration found are the subject of comment and suggestions for improvement are given. The need for strict control and supervision of pasteurizing plants is stressed. Recent research suggests that milk-borne streptococcal epidemics may be due to milk from cows infected with *Str. pyogenes* in addition to direct infection of milk by persons engaged in its handling and distribution.

TUBERCULOSIS.—The incidence of human pulmonary TB. due to bovine tubercle bacilli is considered, and a table given summarizing the recent position in Great Britain.

MEAT INSPECTION AND FOOD POISONING.—The number of food poisoning outbreaks reported to the department was 94, as compared with 82 in 1936; 77 were investigated at the Ministry's laboratory. There were 45 cases of SALMONELLA INFECTION as the cause of acute GASTRO-ENTERITIS. Duck eggs were responsible in three and pig flesh was suspected in ten outbreaks due to SALMONELLA INFECTION. Reference is made to the effect of the Livestock Industry Act, 1937, on the future of meat inspection. The Livestock Commission is empowered to set up three experimental central abattoirs, the ultimate aim being their general establishment.

The Ministry's Laboratory issued 600 ml. of antirabic vaccine.—J. C. W.

BOOK REVIEWS

WELLINGS, A. W. [M.D.S. (B'ham), L.D.S. (Edin.), Lecturer in Histology and Pathology of the Teeth and Associated Parts in the University of Birmingham]. (1938). **Practical Microscopy of the Teeth and Associated Parts.** pp. xxx+281. London: John Bale, Sons and Curnow, Ltd. [8vo] [12s. 6d.]

This is a book which should be available for the use of all interested in the art of histological technique.

The introduction, which in itself is worthy of publication, is a review of recent investigations, with suggestions as to the particular problems which require further attention. There are twelve chapters of which the first six deal with the preparation of material: fixing, staining, cutting, embedding, etc.; and the remaining six with the specialised dental tissues. The chapter on Fixation and Hardening is excellent.

Of the recent investigations, we would particularly draw attention to the method of cultivation of tooth germs *in vitro*, which should facilitate the study of differentiation and activity of the various tooth forming cells; and to the method of demonstration of lymphatics in dental tissues by the injection of lead acetate, followed by the application of hydrogen sulphide which fixes the injection mass in an easily recognizable form, as black insoluble lead sulphide.

A pleasing feature is that the author refers not only to the correct methods of proceedure but also to the mistakes which should be avoided.—C. W. OTTAWAY.

GROSSFELD, J. [Dr Professor und wissenschaftliches Mitgleid der Preuss. Landesanstalt für Lebensmittel-, Arzneimittelund gerichtliche Chemie in Berlin]. (1938). Handbuch der Eierkunde. [**Handbook on Egg Production**]. pp. vii+375. 45 figs., numerous tables. [Numerous refs.] Berlin: Julius Springer. [8vo] [RM. 27].

In this book G. brings together data from the literature of many countries, dealing with production, conservation and examination of all kinds of eggs for human consumption. He deals at great length with the physiology and morphology of eggs, with abnormalities and deformities and with the chemical changes which occur after hatching. An extensive section deals with the chemical and physical properties of eggs. There are 50 pages dealing with changes during storage and the danger of infections and putrefaction; the disinfection of the surface of eggs for storage and conservation is also discussed. Another chapter deals with the value of eggs for human consumption, illness that may follow the consumption of eggs, idiosyncrasy, etc. Infected eggs are particularly dangerous when used in conjunction with other ingredients, as in the manufacture of ice-cream, whipped cream, etc., and these are the cases which lead so often to enteritis and other forms of food-poisoning.

Other chapters deal with statistics of egg-production in Germany and other countries, food control legislation in Germany and the marking and grading of eggs. The last chapter gives instructions for the examination of eggs and egg-products.

—M. F. BENJAMIN.

RÖDER, O. [Geheimer Medizinalrat, em.o Professor der Veterinärchirurgie und der Operationslehre an der Universität Leipzig], & BERGE, E. [o. Professor der Veterinärchirurgie und der Operationslehre, Direktor der Chirurgischen Tierklinik an der Universität Leipzig]. (1939). Chirurgischer Operationstechnik für Tierärzte und Studierende. [**Surgical Technique for Veterinarians**]. pp. viii+225. 136 figs. Berlin: Paul Parey. [8vo] [RM. 8.80].

This new edition closely resembles the previous one of 1935 and only details have been altered. The reviewer's opinion of the third edition [*V. B.* **6.** 196.] applies equally to the fourth.—J. E.

HAGEDOORN, A. L. [Ph.D., Privaatdocent, State University, Leiden Secretary, Nederlandsche Genetisch Vereening Soesterberg, Holland]. (1939). **Animal Breeding.** pp. 304. 29 figs. London: Crosby Lockwood & Son Ltd. [8vo] [15s.]

This is essentially a book for animal breeders and farmers and does not go deeply into the science of genetics. It can therefore be understood by anyone concerned with the raising of animals. The author remarks on the false standards of judging at shows, where the animal is graded according to its appearance and not according to the worthiness of its progeny. He refers to the insufficiency of data in some stud books and shows how the situation in these respects could be improved. The book is full of practical interest for the veterinarian and contains two chapters of particular interest to him—on lethal factors and disease resistance.

—J. E.

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